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Contributions.

ANDREW CARNEGIE.

BY J. D. REID.

Andrew Carnegie (an unusually fine likeness of whom we have added to this article), or "Andy," as we call him, came to the telegraph office in Pittsburgh, Pa., in 1848, asking employment. He was very small and spare, light haired, and had a cheerful, fixed look about his eyes which said very clearly, "If you employ me I will do my duty." It was easy to see he was Scotch—at least, easy to us. He had the true Dunfermline ring in his voice, to which with clannish instinct we warmed. He was at once engaged, being then thirteen years of age, having been born in Dunfermline, Scotland in 1835, and, newly arrived in America. He commenced his duties at once; was prompt, correct, and faithful in all he did. He was in all respects a model messenger, sparing no pains to secure delivery of every message intrusted to his care.

Very soon his attention was attracted to the machinery of the office, and he asked permission to learn to operate. It was given cheerfully. He acquired the art with great rapidity, and in 1850 was employed as an operator. In this employment he remained up to 1852, when his steady, industrious habits caught the attention of Col. Thomas A. Scott, then the Superintendent of the Western Division of the Pennsylvania Railroad, and he became his clerk. In this capacity he made himself so useful in connection with the use of the telegraph line for regulating railroad trains that in 1853 he was largely intrusted with the train movement of the whole Western Division, and became an object of universal confidence and respect. He combined in that small boyish form the solidity of a man, and displayed that tact and skill for which so many of his countrymen are noted.

In 1857 young Carnegie followed Col. Scott, then General Superintendent of the Pennsylvania Railroad, to Altoona, where he practically became his assistant, and for two years attended to the responsible duties incident thereto. We recollect well meeting him one fall morning, as we walked along the track on the summit, after we had come back from the South with broken health and broken hopes. We had long since learned to admire and love him, but when we looked upon his small, boyish form and realized that a hundred thundering trains were guided by his cautious and well poised brain, and listened to his quiet, hopeful words, we felt that the boy was the master, nor did we grudge him the honor of the avowal.

In 1859 he was appointed Superintendent of the Western Division, and remained so until 1861, when he was summoned to Washington to serve under Col. Scott, who had recently been appointed Assistant Secretary of War, and on whom most arduous and perplexing duties had devolved. To Carnegie was assigned the duty of arranging the military system of railroads telegraphs which he did with most consummate skill. It was in this stage of the military telegraph organization that he called David Strouse, D. H. Bates, Richard O'Brien, Jesse Crouse, and many others into active service, who must all remember the practical good sense which characterized the organization under Carnegie's management.

In 1862 Mr. Carnegie returned to Pittsburgh at the urgent request of the Pennsylvania Railroad Company to resume his superintendency. By a few fortunate investments in oil and iron he quickly netted \$150,000. In 1864, with health somewhat impaired by labor, he resigned and went to Europe, taking his venerable mother with him to see their native land again.

In 1864 Mr. Carnegie organized the Keystone Iron Bridge Works, of which he is now President, on the work of which there is employed about 500 men, and which has been a great success. He was also the principal instrument in the organization of the Pittsburgh Locomotive Works, and also of the Union Iron Mills,

where 500 men are constantly employed. About this time, also, he engaged actively in the sleeping car movement which has now become so indispensable a part of our railroad system, from which he derived a very handsome return, and by all these enterprises added largely to his fortune. The general superintendence of the Pennsylvania Railroad was offered to him, but declined. He has lately returned from a successful mission to Europe whither he went to negotiate the bonds of the St. Louis Bridge Company, the construction of which has been undertaken by the Keystone Iron Bridge Company, of which he is President.

Mr. Carnegie is now 35 years of age, and is said to be worth one million of dollars. He carries with him the same unostentatious manner and the same self-poise and confidence which marked him as a boy. What he takes hold of he carries through without fear of miscar-



ANDREW CARNEGIE.

riage. This cheerful, hopeful, or rather confident, element in him is quite marked. His mind seems instinctively to take hold of the right thing in the right way, and to move it to fruition by a steady, earnest unflinching will. He is public spirited, entering heartily into all popular enterprises, is liberal in his charities, and helpful to young men starting in life. He is fond of books, especially such as are historical or connected with public affairs. We notice his name as among the \$1,000 contributors to the Stanton fund, and also as one of the officers of the contemplated bridge across the Hudson Highlands.

INVENTORS AND INVENTIONS.

The RAILROAD GAZETTE has recently contained both editorials and contributions on this subject, which have evidently been written by men who have never themselves felt either the parturient pangs or the paternal pride of those who have actually created some machine or device that had no previous existence, yet was of benefit to mankind.

To make safe what has been dangerous to human life, to render cheap and abundant what was previously scarce and dear, to make rapid and comfortable what was the reverse of this, to add largely to the comfort and prosperity of mankind, to solve problems hitherto regarded as impossible of solution, to conquer nature and wrest from her stubborn womb secrets never before divulged to humanity—these are the noble aims of the inventor. He is rather the recipient than the creator of his discoveries. An idea, winged fresh from on high, descends upon him, and whether hospitably received or not, from that hour he knows no peace unless he follows its behests. It comes and goes unasked and un-

bidden. It is with him in the midst of his most active labors. It is often most irrepressible in the dead hours of the night when all around are wrapped in profoundest slumber. It will, it must be wrought out. It may really be nothing at last. But good or bad, it must out, and be subjected to the crucial test of actual use.

Especially is the railway, in its entirety, the offspring of the inventor throughout, and it always must continue to be so. It was born among as many doubts and scoffs as ever threw cold water on the sanguine schemes of men. A person yet alive, and only of middle age now, who was an apprentice at the time in the machine shop at Newcastle Upon-Tyne, where George Stephenson had much of his work done, distinctly remembers hearing a letter from him to his friend, the foreman of the shop, read aloud to the men at their noon rest. "I do believe, man," wrote the father of railways, in his quaint old English style, "that an engine will drag wagons on a smooth rail. Do not you and your men agree with me?" This was received by the men with an unanimity of doubt which caused his correspondent to write back that he had a large family dependent on him which it was his duty to keep off the parish, and that for their sakes he must abandon these visionary notions and go back to his work. This of course was the general opinion of experts. Who but an inventor can realize Fulton's emotions, as the badly-built, ill-proportioned little Clermont, leaking steam at every joint, made the first doubtful, hesitating revolution of her wheels, amid the scoffs of the lookers-on? How must the cold sweat have broken out all over him as he set out on his more than doubtful journey, all he had in the world—reputation and money and debts—staked on the venture! In a letter written by him to a friend on the morning of his triumphant return, now before the writer, he modestly says: "My steamboat voyage to Albany has turned out rather more favorably than I anticipated. The distance from New York to Albany is 150 miles. I ran it up in 32 hours and down in 30 hours. The latter is just five miles an hour. * * * I overtook many sloops and schooners and passed them as if they had been at anchor. The power of propelling boats by steam is now fully proved. The morning I left New York, there were not perhaps 30 persons in the city who believed that the boat would run one mile an hour. While we were putting off from the wharf, which was crowded with spectators, I heard a number of sarcastic remarks. This is the way, you know, in which ignorant men compliment what they call philosophers and projectors. * * * It will give a cheap and quick conveyance to merchandise on the Mississippi and Missouri and other great rivers which are now laying open their treasures to the enterprise of our countrymen. And though the prospect of personal emolument has been some inducement to me, yet I feel infinitely more pleasure in reflecting, with you, on the immense advantage that my country will derive from this invention." These last remarks are indeed the vital spark, the soul, which stimulates the efforts of most inventors.

"The skill which conquers space and time,
That graces life, that lightens toil;
May spring from courage more sublime
Than that which makes a realm its spoil."

A recent article published in your paper, in speaking of the slow development of the railway system shortly after its inauguration, says: "That many of the improvements alluded to were, at the time they were introduced, regarded as of vital importance, we have no doubt. How important they were, we of the present day fully understand. We are sometimes led to wonder that they did not follow each other in rapid succession; yet when we consider that in those days nearly, if not all the improvements in the rolling stock of railroads were expected to be made by the civil engineers of such roads, and that their duties were very arduous, our wonder to a great extent ceases, and is changed in another direction."

There is a great deal of this feeling yet existing among railway men. They regard themselves as per-

fect in their profession, and resent as insults all proposed innovations and improvements. They know it all now—have you the audacity to offer to teach them? Then, too, not five per cent. of these proposed improvements are of any practical value after all. Why not be right ninety-five times even if wrong five times in a hundred, rather than run the risk of reversing these figures? We get just as much pay per month if we snub these fellows—why, then, listen to their visionary proposals? Yet the railway system is no more perfect than it was 40 years ago. As grand inventions are yet in the unknown future as have ever come out of the past. Proud men, dressed in a little brief authority, may frown upon the daring proposers who stand before them with their schemes! Yet they can no more be kept down than the winds which career over yonder lake can be controlled.

I wish it was in my power to offer some feasible, practicable method by which new inventions of value might be tested and introduced, and the inventors properly rewarded. But to me, there really does not seem to be any. I wish I knew how to request of railway presidents, superintendents, chief engineers, and so on down the gamut of red tape, more accessibility, more urbanity, more patience to listen to modest genius, perchance with ragged or greasy clothes and hardened hands, standing before them, endeavoring to explain, in faltering words, ideas that are really too big for utterance. Is such a request an unreasonable one? But few men can understand the lions in the path of an inventor. Has he an idea, for instance, that he can furnish a better track than the present one, smoother, far safer, requiring fewer section men to watch and repair, and also saving half the iron that is now used? All are against him. To begin with the rolling-mills: of course they want no such scheme to succeed, and will not look at it. None of the officers care to leave the beaten track. They know that they are paid for what they now do, and are satisfied. Why look out another? Of course road masters and section men do not want it. Even if it really does what is represented, after all it may be a failure. Why should any of the great men at the top of the heap smile on such advice till it is an assured success—proved beyond possibility of failure? Did not the mother positively forbid her boy going into the water till he knew how to swim?

No, there seems to be no royal road for testing inventions, unless their possessor has "influence," and knows how to use it. The true inventor will go on as he has gone, striving and straining, perhaps in poverty, bad health, and every possible discouragement, in his efforts for better things. He will work on, undeterred by the insolence of officials, or the doubts and incredulity of those to whom have not yet been vouchsafed those inner lights which shine so clear to him, and which forbid him to doubt, for a moment, the safety of his positions. Go on, noble men, go on! Ye are the salt of the earth, and the world is not worthy of you. Yet, in the midst of your contests with things and obstacles both animate and inanimate, always remember, with such comfort as may be got out of the fact, that you are not the first of your kind, and that the last will not cease to exist while mankind remains on earth, and men persist in striving onward and looking upward, yearning for better things.

To a true lover of inventions, fond of inspecting the achievements of men in these upper realms, what enjoyment can equal the inspection of a successful machine, a locomotive for instance, one of the highest achievements which man's intellect has yet achieved? Fancy brass work and gew-gaws upon this monster of human creation strikes one as disagreeably as the fripperies and laces of fashion upon a woman made beautiful by nature. For a very humble neophyte, yet faltering on the outside threshold of those enchanted halls in which so much light, brilliancy, genius, intellect, and magnetism are concentrated for the welfare of the human race, the writer looks upon such inventions as Gifford's Injector, the Air Brake, Miller's Platform and Coupler and other glorious mechanical triumphs, with as much real pleasure and satisfaction totally unalloyed by grudging or jealousy, as if they were the achievements of his own brain.

Could these remarks but reach the eyes and hearts of those seated in softly cushioned chairs, in elegant offices, and induce them to make some sort of organization that would, in good and solid truth, fairly and impartially test all proposed railway improvements, which have any show of feasibility, the object of the writer would be more than attained. He frankly confesses that he could hope for no such result. It will, he fears, be the fate of the inventor, in the future as it has always been in the past, to struggle on at first, even perhaps at last, in poverty and discouragement, and

seldom to reach the shining summit of success. He who dreads this ordeal—who falters at words of coldness and doubt, or who ever looks back after once satisfying himself that there is any hope of success by going ahead, is unworthy the name, and deserves no place in their noble ranks.

Yet should a single railway manager be induced, by a perusal of this article, to hearken with an appearance of civility and patience to any class of "patent right" men, anxious for an opportunity to test their proposed improvements for the benefit of those whom it may hereafter concern, he will feel amply rewarded for the effort these expressions have caused.

OCCIDENT.

GRAND TRUNK RAILWAY.

Report for the Half-Year Ending June 30, 1870.

The main line of the Grand Trunk Railway of Canada extends from Detroit, Mich., by way of Port Huron, Toronto, Kingston and Montreal, to Portland, Me., a distance of 851 miles. The section of this line between Detroit and Port Huron, 59 miles, and between Portland and Island Pond, N. H., 150 miles, comprising the part of the line in the United States, are leased by the Grand Trunk Company. It owns also a branch from Richmond, 76 miles east of Montreal, northeastward past Quebec to Rivier du Loup, a distance of 222 miles, which has itself a branch from Arthabaska northward to Three Rivers, 35 miles, and a line 40 miles long known as the Montreal, Lachine & Province Line Railway. It operates under a lease, in addition to the sections named above, the Buffalo & Lake Huron Railway from Fort Erie (opposite Buffalo) northwestward to Goderich 168 miles, and the Montreal & Champlain Railroad from Montreal southward to Rouse's Point, New York, 49 miles. The entire length of lines owned is 958 miles, of lines leased, 419 miles, total, 1,377 miles.

The following report for the last half-year was made at the meeting of stockholders on the 27th ult:

June half of 1869.		June half of 1870.
\$	The gross receipts upon the whole undertaking, including the Buffalo and Champlain lines, have been.....	704,567
	Deduct—	
455,958	The ordinary working expenses (being at the rate of 69.96 per cent. against 67.59 of the corresponding half of last year).....	492,921
	The renewals, &c., of the permanent way and works in the half-year debited to revenue.....	66,781
	Leaving an available balance earned in the half year of.....	144,865
24,841	Deduct loss on American currency.....	7,117
116,783	Balance.....	137,708

To this sum of £137,708 has to be added the balance carried from the net revenue account of the last half-year of £1,618; making a total balance of £139,326. From this, however, has to be deducted the amount of postal and military revenue due for the half-year to the postal bondholders of £19,722; leaving the balance of £119,604.

Applicable for the following payments, viz:—

Interest, etc., paid on lands.....	\$1,848
" on mortgage to Bank of Upper Canada.....	4,424
" on loans, bankers' balances, promissory notes European exchanges, etc.....	3,357
Interest on British American Land Company's debentures.....	616
Interests on Montreal Seminary debentures.....	616
Interest on Island Pond debentures.....	2,700
Half-yearly instalment on Portland sinking fund.....	2,369
	\$15,360
Atlantic & St. Lawrence lease (in full).....	34,516
Detroit line lease (in full).....	11,250
Montreal & Champlain Railway Company.....	9,218
Buffalo & Lake Huron Railway Company.....	22,500
1st Equipment bond interest.....	15,000
2nd Equipment bond interest.....	2,450
	\$97,034
Balance.....	8,639
	\$119,603

Comparing this half-year with the corresponding period of 1869, there is an increase of £1,935 in the passenger receipts, and of £28,011 in the freight receipts, making a total increase in the gross receipts of £29,946. The number of passengers carried was 700,334, against 655,850, and the gross freight tonnage conveyed was 612,959, against 520,881, showing an increase in passenger traffic of 6.78 per cent., and in goods traffic of 17.67 per cent. But the average receipt per passenger was only 6s. 5d. against 6s. 9d., and per ton of goods, only 15s. against 16s. 6d. These figures explain the reason why the receipts have not increased in the same proportion with the traffic carried, and Mr. Brydges accounts for this state of things in the following words:—"As regards rates for property from the east to the west, &c., on manufactured and imported goods, which are of course the most valuable we carry, the rates in many cases during the whole half-year were almost nominal. As compared with the half-year ending June, 1869, the rates for a very considerable period were in the proportion of 25 cents per hundred pounds between New York or Boston and Chicago in 1870, as against \$1.00 per hundred pounds in 1869—that is to say, that for a considerable period of the half-year a very valuable portion of our traffic had to be carried at only 25 per cent. of the rates which were in force in the year previously. From the west the reduction was not

so great, but it averaged 15 to 25 per cent., and of course upon the much larger quantity of business moved from the west to the east, it inflicted a very serious loss indeed upon our gross receipts. Cattle rates were also largely reduced. The usual rates per car from Detroit to Buffalo are \$35 to \$40. During a large part of last half-year they were from \$10 to \$12 a car. We have carried an increased tonnage of close upon 18 per cent. in weight, and with proper and reasonable rates that increased tonnage ought to have given us at least £30,000 more gross money than it did—all of which would of course have been profit. The same general statement applies to passenger traffic. Early in the season, the quarrels between the great New York lines forced a reduction in the passenger fares between Boston and Chicago from \$24 to \$18, or 25 per cent. Those rates have remained low during the whole of the busy period of the half-year ending 30th of June, 1870.

It would thus appear that the company have lost during the half-year as much as £30,000, not of gross receipts, but of net profit, principally by the unfortunate competition which has existed between great American lines, and partly by the low prices of produce, and the Fenian invasion of May and June also caused an interruption of business for a considerable length of time. The aggregate expenses for the half-year, including renewals, amounted to £559,702, or 79.43 per cent. of the receipts, as against 79.01 per cent.; and excluding the renewals, the ordinary working expenses were 69.96 per cent. of the receipts, against 67.59 per cent. for the corresponding period of 1869. The excess expenditure of the half-year was £36,963, of which sum about 40 per cent. is chargeable to the locomotive and carriage departments, 33 per cent. to the traffic department, and the remainder to hire of rolling stock. This excess is due to extra train mileage for the greater amount of traffic carried, the engine mileage having thus been increased by 189,955 miles, and the car mileage by nearly 3,000,000 of miles. The expenses of the traffic department were unavoidably increased in like manner, partly for the service of this extra mileage, but partly also by the outlay for extra watchmen and precautionary measures rendered necessary at the time of the Fenian invasion for the protection of the railway. The unfavorable comparisons of the per centage of working expenses between this half-year and the corresponding half-year of 1869, are therefore due principally to the low rates and fares which have prevailed. It will be observed, on the other hand, that in the charge for maintenance of way there is a reduction of £2,292, arising, in spite of the extra traffic, from the improved condition of the permanent way. The number of miles of railway relaid with new iron in the half-year was 49 miles, the number of new ties put into the track was 29,973, and 33,836 cubic yards of ballast was laid upon 20 miles of railway. The steel rails sent out this year are in course of being laid in the railway west of Montreal, and they will all be in the line before the winter sets in. The accounts received thus far of these steel rails are very satisfactory, and arrangements are in progress for an additional supply of 6,000 tons for next season. The loss upon the conversion of the receipts in American currency is less than it has been since June, 1863, and there is every reason to hope, not only that this reduction will be permanent, but also that this item will disappear altogether at no distant period from the company's accounts. The items charged as additions to capital during the half-year are fully set forth in the accounts, and explain themselves. But out of the total balance of £50,614, there is a sum of £37,833 for the completion of the payment for the new engines purchased in Glasgow, and another sum of £9,190 for the balance of the purchase money of the Toronto rolling mill. The construction of the Intercolonial Railway is being pushed forward with vigor, the whole line being now under contract, and the progress already made leaves little doubt that portions of it will be opened next year, and the remainder by the end of 1872. The Commissioners have already advertised for tenders for 40,000 tons of steel rails, and are otherwise building the railway in a substantial manner, with a view to its occupying, in connection with the Grand Trunk system, a prominent position amongst the great through routes between the Western States and the Atlantic Ocean.

In the pursuance of powers conferred by a clause inserted for the purpose in the Canadian Act of Parliament which was passed during the last Session (for confirming the agreement with the Buffalo Company) the directors have entered into an agreement with the International Bridge Company for the lease for 999 years of their bridge and all its appurtenances, as well as for the assignment of all the tolls, rights, powers, and franchises of the Bridge Company, upon payment by the Grand Trunk Company of an annual sum of £20,000 about £16,000 of which constitute rent, and the remaining £4,000 sinking fund for the redemption of the capital. This sum will be paid by half yearly instalments, to commence from the first day of January, 1872, by which date the bridge is contracted to be open for traffic. The progress already made, and which was secured by the loan of £20,000 authorized to be made to the Bridge Company at the meeting held in April last, is satisfactory, and the whole of the work intended to be carried out this year is in an advanced state. Upwards of £50,000 will probably be expended by the close of the present year, and the directors hope to be in a position to lay before the proprietors at the approaching half-yearly meeting the proposals for raising the bridge capital.

The directors have to express their deep regret at the death of Mr. Moreland, the late Canadian auditor, who was for many years a faithful servant to the proprietors. It appeared to the two remaining auditors that efforts should be made to procure in Canada for the last half-year's accounts the services of a gentleman of commercial eminence and independence, and accordingly, with the concurrence of the board, application was made to the Bank of British North America to permit their manager at Montreal, Mr. Hooper, to act *pro tem.* as auditor

in Canada, and he writes as follows to his London colleagues:

"I have made a special audit of the Grand Trunk Railway Company's accounts for the half year which ended on the 30th of June last. I have given an official certificate of the correctness of the accounts, and I only desire to add for your information, that I have gone through all the general books of the company here, and that every facility has been accorded me during the period of my examination and investigation by the company's officers, and all desired information and requisite assistance freely given. The books are well kept, and as closely written up as the nature of the work will permit, and the constituted checks on the accounts I consider to be well devised and efficient, and regularly observed by the officers. The system adopted of paying all liabilities by cheque on the authority of a warrant duly signed, as well as that of deposit being made direct by the company's cashiers themselves to the credit of the company with its bankers, are fundamental safeguards of a most important character. The stock books, accounts of stores, stationery, &c., accounts between departments, and the periodical returns from stations, appear to be all in order, and the various checks in regard to them well calculated to prevent irregularity.

"The directors have watched the working of this half-year with anxiety, and have considered its results with the greater care, because they believe the present to be an important crisis in the history of the undertaking. They have, with the assistance and co-operation of the proprietors done all that was possible in restoring the credit of the company, in paying off the debts and liabilities by which it was embarrassed in previous years, in improving the condition of the permanent way and rolling stock, and adding liberally to the plant and buildings. They have thus been able to perform far more than appeared to anyone to be possible twelve months ago; and after concluding a permanent agreement on fair terms with the Buffalo Company, they hoped for a great and immediate improvement, not only in the gross receipts, but also in the net profits of the undertaking. The former they consider to be of no importance, excepting in so far as they contribute to the latter; and an increased return to the proprietors is the primary object which they have kept and will keep steadily before them. They have up to the present time experienced much disappointment. The increase in the gross receipts, as compared with the corresponding half-year of 1869, has been only £29,946; and the increase in the net receipts only £12,384. These are results very different from those which they considered themselves justified in anticipating; though they are quite as good as they were able to hope for when they found, during the half-year, the various disadvantages under which the executive in Canada were laboring. The low fares and rates which have ruled, more or less, during the half-year, were dependent on competition between their rivals, on the prices and demand for produce, and on other circumstances which were entirely beyond their own control or that of their officers, and there must sooner or later be a material improvement in this respect. The Fenian invasion, which diminished their traffic and disorganized their staff, they had no means of averting. Meanwhile, the International Bridge over the Niagara river at Buffalo is steadily progressing; the Intercolonial Railway is being rapidly constructed; the loss by discount on American currency has materially decreased, and there are other symptoms of hopeful augury for the future. The extra resources which have been supplied for rendering the route more attractive, and for increasing the traffic, have not yet had time to bear fruit. The line is being prepared in all respects for the time when paying rates and fares combined with an important increase of traffic must produce the effects to which all who are interested in it can only now look forward. Taking a calm view of its prospects as a whole, it is so far satisfactory to remember that an important advance has been made towards general improvement. The undertaking is now in a thoroughly sound and stable condition. It is entirely free from debt, and with a turning tide of reasonably paying rates and fares, there must come that measure of prosperity for which the directors have so anxiously labored and which the proprietors have so long expected. The usual half-yearly reports of the engineer and of the locomotive superintendent are appended; as is also the list of stock and bondholders whose names are now registered in the company's books.

DIRECTORS.—Richard Potter, Esq., Standish-house, Gloucester, President. Thomas Baring, Esq., M. P., Bishopsgate street, E. C.; Charles John Brydges, Esq., Montreal; Hon. James Ferrier, Montreal; Robert Gillespie, Esq., Gravenhurst, Bolney, Essex; Kirkman Daniel Hodgson, Esq., M. P., Bishopsgate street; Grosvenor Hodgkinson, Esq., M. P., Newark; Graham Menzies, Esq., 58 Westbourne terrace, W.; William Molson, Esq., Montreal; John Swift, Esq., Portland place, London; Captain Tyler, High Elms, Hampden Court; Lord Wolverton, 67 Lombard street, E. C. **Auditors.**—Angus C. Hooper, Esq., Montreal, *pro tem.*; William Newmarch, Esq., F. R. S., London; J. G. T. Child, Esq., Manchester.

REPORT OF THE ENGINEER.

I beg to submit my report of the working of this department during the half-year ending 30th June, 1870:

Maintenance.....	£307,384 30
Renewals, etc.....	325,000 00
Total.....	£632,384 30

The cost of maintenance during the half-year ending 30th June, 1870, was \$11,157.37 less than in the corresponding half-year of 1869. Forty-nine miles of new iron rails have been put into the track during the six months.

Ballasting.—Owing to a favorable spring and summer we hauled out on the track 33,850 cubic yards to the 30th June, ballasting 20 miles of railway; and up to the present date we have worked these trains regularly, se-

curing new ballast pits, and diminishing the haulage as much as possible; but in the district between Montreal and Prescott, 112 miles, we are still without a good ballast pit, although we have been and still continue to prospect the country along the line, but without finding material suited to our wants.

Bridges and Culverts.—The repairs of the bridges, culverts and embankments damaged by freshets of last year will be completed this season. The bridges and culverts generally throughout the line are receiving all necessary repairs to maintain them in an efficient condition. The fifty-three miles of imported English steel rails have arrived, and are rapidly being laid in track, together with ties and ballast, to make a first-class road-bed. Our renewals of fences will be very extensive this year, owing to the improvement of land along our road demanding better fences than originally made, especially on the Portland district and between Stratford and Fort Erie. The ferry works at Sarnia are in good repair, and those at Fort Erie and Buffalo are maintained to do our work until the completion of the International Bridge. The new freight-shed and engine-house at Brockville, as also the new engine-house at Toronto and machine-shop at Stratford, progress favorably. The freight-shed at Brockville is now receiving traffic, and the other works will be ready for use next winter and spring. The additional siding and freight accommodation at different points is being rapidly proceeded with. The condition of the permanent way and works exhibits a steady improvement, and with the steel rails now being put into track will, we have every reason to expect, secure that permanent efficiency so necessary for our increasing traffic. The details of material put into track and work performed for the year will, as usual, be contained in my report for the current December half-year.

REPORT OF LOCOMOTIVE SUPERINTENDENT.

We have received a small addition to our rolling stock from capital account, viz.: six passenger engines, two baggage and post-office, and two baggage cars. These were supplied to us during the month of June, and they are doing good service. It will be observed that a largely increased mileage has been run both by engines and cars, the former being 41,000 and the latter over 480,000 per month in excess of the June half of 1869. The locomotive expenditure, mileage, cost per mile, &c., for the past half-year were as follows:—Total train miles, 2,749,045; expenditure, \$846,095; rate per train mile, 30.78c.; per centage on gross receipts, 24.67c. As compared with June, 1869, the train mileage shows an increase of about 7 per cent., and the expenses about 3.4 per cent. The extra train miles 189,955, at last year's cost per mile, would account for an increased expenditure of 60,386; the extra work has, however, been performed at an increase of only \$29,917, reducing the rate per train mile from 31.89 to 30.78, a decrease of 1.11 per mile run. The outlay upon renewals has been \$46,516, which represents the net cost of three new engines built at Portland, and balance expended upon two built at Port St. Charles, replacing five worn out engines, part of which have been broken up and sold. The repairs to our engine stock have been carefully attended to, and forty-eight renewed axles have been put under engines and tenders. The expenditure for fuel shows an increase of \$10,083; the extra engine miles, however, at rate per mile of June, 1869, would represent an increased expenditure of \$25,270, showing that a saving of \$15,187 has been made on work done, part of which is due to increased economy in consumption, and part to a slight decrease in the price of fuel. The car expenses, mileage, &c., for the past half-year were:—Total miles run by cars, 33,239,777; repairs and renewals, \$291,164; cost per car mile, 0.876c.; cost per train mile, 10.59c.; per centage on gross receipts, 8.49c. The increase in expenditure over June, 1869, is \$44,202; of this the extra car miles, 2,938,804, account for \$23,922, and the balance is made up of improvements to our stock of passenger cars, and to new and improved trucks for the old freight car stock. The rate per car mile has increased 0.062c., and per train mile 0.95c., but our car expenditure is still considerably below that of most of the railways in Canada or in the United States. As regards renewals, we have constructed the following cars to keep up the stock:—21 composite brake van and emigrant cars, 9 box cars, and 52 platform cars; 16 box cars have been rebuilt, 22 platform cars have been rebuilt, and 218 new standard lateral motion freight trucks have been built to put under our old freight car stock. The repairs have been more than usually extensive, especially to the passenger cars, in which great improvements are being made. This, of course, increases the expenditure, but it is absolutely necessary to enable us to meet the present requirements of the traveling public. Every possible effort has been made to maintain our whole stock in efficient working order.

Baron von Weber's Experiments on the Stability of Permanent Way.

[Continued from page 149.]

The stability of a permanent way structure in a longitudinal direction is considered, by Baron von Weber, as depending upon the bedding of the sleepers in the ballast, the friction of the rails upon the sleepers, the strength of the spikes or other fastenings, and, lastly, upon the strength of the connections between the ends of the rails. These connections have, in the first place, to keep the heads of the rails in their proper position with regard to each other; next, to give to the joint a certain amount of rigidity; and, finally, to insure that the horizontal or vertical deflections of the two rails connected take place together. Of the many forms of connections which have from time to time been proposed for rails, but two practically fulfil the conditions just mentioned, these two being the joint chair and the fish-joint in their various modifications and forms. On joint chairs but few accurate experiments have been made, but enough has been done to show that although in some forms they fulfil the first and second conditions

we have mentioned very perfectly, they mostly fail with regard to the third. As early as 1834, Mr. Peter Barlow made some experiments which showed the want of rigidity in the joints of rails united in joint chairs, and it was the result of his researches which led to the practice, resorted to for many years, of placing the joints of the rails on firmly bedded supports. With the more general introduction of the fish-joint, however, attention became directed to giving to the joint itself greater rigidity, and with this object rails divided into several parts disposed so as to break joint were used by Breithaupt, at Buckeburg, as early as 1844; by Busse, at Leipzig, in 1845; and subsequently by Winslow and Latrobe, and several others. These systems were, however, all discarded on account of their many parts working loose.

The first important experiments made in Germany on the strength of fish-joints were those conducted in 1851, by Herr T. Weishaupt, who tested the fish-joints of the following railways:

Eastern Railway of Prussia.....	Fish-plates 18 in. long, weight 6-3 lb., fastened by four bolts.
Lower Silesian Railway.....	Fish-plates 11½ in. long, weight 5½ lb., fastened by four bolts.
Lubeck-Buchener Railway.....	Single fish-plate. 15 in. long, 3½ in. deep, weight 12 lb. fastened by four bolts.
Westphalian Railway.....	Angle fish-plates. 15 in. long, weight 9 lb., fastened by four bolts.

Herr Weishaupt's experiments proved that the fish-plates generally failed utterly with loads below those necessary to deflect the rails with which they were used beyond the limits of elasticity. The following is a summary of the results obtained by him, the rails and joints, we should mention, being supported on bearings 3 feet apart:

	Eastern Railway. cwt.	Lower Silesian Railway. cwt.	Westphalian Railway. cwt.
The fish-plates were broken or completely bent by an average load of.....	85.4	130.4	110
The limit of elasticity of the rails was reached by a load of.....	170	166	139
The deflection of the fish-plates to the inadmissible extent of 0.3 in. was caused by a load of.....	71.9	68
Under the same load which caused a deflection of 0.3 in. in the fish-plates, the deflections of the corresponding rails were.....	in. 0.05	in. 0.031

In 1853 Malberg made some interesting experiments for ascertaining the relative strength of iron and steel fish-plates, these trials being conducted on the fish-joints of the Bergish Markish Railway. The fish-plates were of the following kinds.

- (A.) Iron fish-plates, 15 in. long, 2½ in. deep, weight, 11 lb., three bolts.
- (B.) Flat iron fish-plates, 21 in. long, 3½ in. deep, weight, 13 lb., four bolts.
- (C.) Puddled steel fish-plates of curved section, 21 in. long, 3½ in. deep, weight, 13 lb., four bolts.
- (D.) Puddled steel flat fish-plates of same dimensions &c., as (C).
- (E.) Iron fish-plates of curved section, and of same dimensions &c., as (B), (C), and (D).

In these experiments the fish-joints were fastened to short pieces of rails, and were supported by wooden sleepers placed 2 ft. apart, the loads being applied by a small hydraulic press. The fish-joint (A), was found to offer the least resistance to vertical pressure, a deflection of 3-16 in. taking place with a load of 4,990 lb., and the plates breaking through the centre hole with a load of 13,080 lb. In the case of the fish-plates (B) and (D), which were of similar dimensions, but made, the one of iron and the other of puddled steel, the results were as follows: With a load of 5,170 lb., the iron fish-plates (B) deflected to an extent greater than would be admissible in the line, with a load of 6,250 lb. a permanent deflection took place, and with a load of 11,200 lb. they became distorted laterally (but not broken), the deflection being then 1½ in. In the case of the steel fish-plates (D), a load of 7,500 lb. caused a deflection which would be inadmissible in the line; a load of 7,690 lb. produced a permanent deflection; and fracture was caused by a load of 17,980 lb. In the case of the iron fish-plates of curved section (E), an inadmissible deflection was produced by a load of 5,260 lb., which also produced permanent deflection; while under a load of 11,280 lb. the plates became utterly distorted, without, however, being broken. In the case of the steel fish-plates (C) of the same shape as those last mentioned, the inadmissible deflection was produced by a load of 5,620 lb.; and a permanent deflection by a load of 7,690 lb.; and fracture through the inner holes by a load of 14,370 lb.; the ultimate deflection being 1½ in. The rails which these various fish-plates connected, when tested in the same way, showed a deflection of 1-12 in. under a load of 18,000 lb., while a load of 19,000 was required to produce a permanent deflection.

These experiments prove the extra rigidity of joint which is to be obtained by the employment of steel fish-plates; but they are also considered by Baron von Weber to prove that the rigidity of the joint is in all cases small compared with that of the rail itself. Baron von Weber remarks that proposals were early made to modify the section of the rails for the purpose of obtaining a better bearing for the fish-plate, while the latter have been—and still are—in many instances made of curved section, and applied with the concave sides next the rail, the idea being that the screwing up of the bolts will cause the fish-plates to flatten, and thus abut closely against the head and foot of the rail. This plan Baron von Weber condemns as inefficient, and he maintains that the only good system is that—now generally adopted—of forming the underside of the head and the upper side of the foot of the rail with inclined surfaces between which the fish-plates are caused to wedge themselves tightly when the bolts are screwed up. The fish-plates of curved section are still used on the Saxon State Railways, and some time ago Baron von Weber carried out a series of experiments on them. 1. To

determine the proportion between the rigidity of the joints and the rail itself; 2. To observe the alteration of the form of this joint produced by great deflections; and, 3. To ascertain the most advantageous arrangement for the supporting points of 18 feet rails united by suspended fish-joints of the class above mentioned. In these experiments the fish-plates were carefully fitted to the rails.

The results of the experiments on the relative rigidity of the rail and joints were as follows: the distance between the supports being 3 feet, and the loads being applied at the centre.

Load. cwt.	Deflection of rail in millimetres.	Deflection of fish- joint in millimetres.
17.5	0.515	0.68
27.5	0.612	1.02
64.7	1.020	3.04
74.4	1.230	
81.7	1.440	9.05
94.7	1.900	
104.7	2.050	15.55

Even with the maximum load the limit of elasticity of the rail was not exceeded, while even the smallest load produced a permanent deflection in the fish-joint. When the load of 104.7 cwt. was left upon the fish-joint the deflection gradually increased, without, however, causing the fracture of the fish-plates.

The second set of experiments, made to ascertain the manner in which the fish-plates became distorted under excessive loads, showed that the fish-plates became bent outwards between the two inner bolts, as seen in Fig. 7; while when this bending became so great that the plates projected beyond the hollow at the head of the rail, as shown in Fig. 8, the deflection went on



increasing with a permanent load. This was the case with the load of 104.7 cwt., a load far below that frequently imposed by the driving-wheels of locomotives.

In deducing from the above experiments the best arrangement of sleepers for 18 ft. rails united by suspended fish-joints, Baron von Weber considered the ends of the rails as girders fixed at one end, and unsupported at the other, the fish-plates being considered merely as connecting the adjoining ends in such a manner that the one had to follow the deflections of the other, only the minimum strength of the joint itself being taken into account. The sleepers also were considered to be supporting points, and not supporting surfaces. If the ends had not been united by a joint, the proportion between the length of the overhanging portion at each end and the distance between the supporting points at the other parts of the rails should have been as 1 to 8, or as 1 to 4, if the abutting ends had been united by a joint which compelled them to deflect together, but which possessed no rigidity in itself. The rails had to be supported by six sleepers each, and in order to get practical dimensions, and taking at the same time into consideration the small amount of rigidity which was given to the joint by the fish-plates, Baron von Weber fixed the distance between the joint sleepers at 2 feet, and decided to divide the remaining 16 feet of the length of each rail into five equal parts of 3½ feet each, placing a sleeper at each point of division. A couple of 18 feet rails were next connected by fish-plates, and fastened down to sleepers arranged in the manner just mentioned, and loads were placed at first upon the joint between the two rails, and next upon the centre of the length of solid rail between two supporting points, the deflections in each case being carefully measured. The experiments were made as nearly as possible under the conditions which would occur in practice, and the results were as follows:

Load in cwt.	Deflection of the rails between supporting points, 31-5 ft. apart. Millimetres.	Deflection of the joint, the joint sleepers be- ing 2 ft. apart. Millimetres.
64.7	0.32	0.30
74.7	0.52	0.53
94.7	0.62	0.62
104.7	0.72	0.72

The deflections above recorded agree with surprising accuracy, and they show that the amount of rigidity to be derived from the fish-plates was very correctly estimated. From the results just noted, Baron von Weber deduces the rule that, where well-designed suspended fish-joints are used, an almost uniform supporting strength will be given to all parts of the road by making the distance between the joint sleepers equal to 0.6 of the distance between the intermediate sleepers, and by distributing the latter at uniform distances along the length of the rails.—*Engineering.*

(TO BE CONTINUED.)

—The New York Bulletin says: "There is a movement on foot in this city to erect an immense grain elevator, with a capacity of nearly, or quite two million bushels, and every improvement and convenience known to modern science. The contemplated site is somewhere on the North River, pretty well up town, where a sufficient depth of water can be obtained for vessels of the largest tonnage, and, though the project is yet in a crude state, it is being pushed forward with considerable vigor, and with every prospect of ultimate success. Some influential and wealthy parties are interested in the matter, among which is one of our greatest and best-known railroad capitalists."

Brotherhood of Locomotive Engineers.

Address of the Grand Chief Engineer.

We give below the most important parts of the annual address delivered by Charles Wilson, Grand Chief Engineer of the Brotherhood of Locomotive Engineers, at their seventh annual convention, held in Nashville, Tennessee, October 19th, 1870:

We now number one hundred and twenty-three divisions; most of them are in good condition. We also have a good prospect of several more divisions being organized, soon. The circulation of your *Monthly Journal* has increased rapidly until it has attained a circulation of nearly eight thousand copies. The financial condition of your organization is excellent. Your officials have had an abundance of funds to meet all bills during the year, and now are able to report a balance on hand for future contingencies.

My brothers, allow me to congratulate you on the encouraging prospect under which you have here assembled, and upon the extraordinary success your organization has met with during the past year, and upon the bright prospect for the future of your Brotherhood.

The public, the press, the railway managers, and the leading men in all professions, award to the locomotive engineers a position of immense responsibility, and I believe that the influence of all the parties named will be used to sustain you in maintaining just as high a standard of character for ability, temperance, morality and a reliability to perform all your duties perfect as locomotive engineers as you choose to make for yourselves. Good reliable men are the cheapest to employ in all kinds of business; but there is no kind of business in which the good qualities of the workman will will save more for his employer, and more effectually benefit the whole public, than the business of running a locomotive engine. Your employers fully understand the advantage of having good engineers, and you need not have the least fear that your labor will not be appreciated if you can succeed in being the means or medium of furnishing reliable engineers to all those who have employment for them. When you establish the fact beyond question, that you sustain and recommend none except such as are reliable under all circumstances, then your Brotherhood will have attained a character that will insure respect for all its members, and a liberal recompense for their services. A few bad men have an influence far beyond what you may, at first glance, think. And if you are honest in your efforts to establish a high standard of character and ability for engineers then you must discard all such as will not conform to wholesome rules and regulations. They have no respect for themselves, and all the credit they possess they acquire by being tolerated in your company. And they injure the reputation of all good engineers. You must put it beyond the power of your Superintendent or Master Mechanic to point with scorn to one of your members, as being an intemperate man, or as being notoriously immoral, or as being a man that neglects his family; or as being a saloon keeper, selling whisky to ruin his brother, and rob his family of their support. In short, you should see to it that no reproach can be brought upon your members; then your side of the record is clear. I admit that you did not hire these worthless characters, but they are in many instances with you, and I urge you to see to it that they no longer rob you of the good name you are entitled to. Once let the public know that you sustain none but worthy men, and then the responsibility of retaining bad men will rest where it belongs.

I noticed with pride the improvement already made in many divisions, in the moral status of their members, and I earnestly hope that every division of our Brotherhood will see to it that they do not sustain men that can in any way disgrace them.

Locomotive engineers do not realize the responsibility of their position, or the strict accountability that the public hold them to, until they meet with an accident that causes the loss of human life, then their character is held up to the closest scrutiny. Then, I ask you, where is the engineer that would like to have it proven that he was in the habit of using intoxicating drinks, or that he was seen drinking at a public bar a short distance from where the accident occurred; or where is the engineer that would like to have it proven that he was a reckless and careless man, or that he was a man of no standing or character in the community where he lived. My brothers, you are all liable to accidents, and it is vastly to your interests to see to it that you not only perform your duties perfectly, but that you see to it that no reproach can be brought upon you by reason of your previous bad habits or character.

Temperance is the crowning virtue of all morals, but to the engineer it is a necessity, and no man ought to be allowed to have charge of a locomotive engine that habitually uses intoxicating drinks. Leaving out of the question everything except the fitness and reliability of the man to run an engine, then the answer is the same in regard to the absolute necessity of his being strictly a temperance man. This temperance question is of the utmost importance to our organization, as the bad example of one man may ruin many others; and the intemperate habits of one of our members casts a stigma upon all his associates. There is nothing that will injure the reputation of an engineer in the minds of all classes of our citizens so quick as intemperance; and the same remark is true in regard to the good opinion of the railroad officials.

The duties of a locomotive engineer are of a character that have a tendency to make him impetuous. He is obliged to make decisions instantly while pursuing his daily labor. He cannot stop to consider what is best to be done to avoid a collision, or to escape a thousand perils he is liable to encounter. As I have already stated he must act instantly, or his efforts to prevent disaster will all have been in vain. Now this kind of life naturally educates a man to act hastily, and it is not to be wondered at that engineers are frequently

considered almost insolent when called to the office for the purpose of investigating some complaint that has been made against them. They are too apt to make up their minds hastily, and, as a general rule, they do not hesitate to say what they think any more than they hesitate to apply the remedy that comes to their mind first to prevent a collision. Now you should all remember that there are always two sides to a story, and it is due to all your officials that they should hear all sides, and then they can better judge which is right. Everybody knows the effect of kind and friendly words when applied to themselves, and is it not reasonable to suppose that the same effect will be produced upon your officials if you treat them as you desire to be treated yourself? I hope that all engineers will duly consider this matter, and I feel sure that a very little thought upon the subject will induce them to be more respectful, and not act with undue haste, if they should be so unfortunate as to be called to the office to answer any complaints. Let us all unite to carry out our policy, and use every effort to promote harmony and kindly feelings at all times.

Your *Monthly Journal* has been well patronized during the past year; and I think that the *Journal* has been the means of extending your organization, as well as more firmly cementing and concentrating your interests. We have been in receipt of many kind words of encouragement in regard to the *Journal* from friends we value highly. And it is a pleasant duty to thus acknowledge their assistance and tender them our grateful thanks.

Your committee entrusted with the duty of selecting a place for the permanent headquarters of the Grand International Division have selected the city of Cleveland, Ohio, as being the best point, all things considered, for the best interests of the Brotherhood, as a permanent location for your headquarters. Your committee will submit a detailed report in writing on this subject for your consideration. I will only add that after a residence in Cleveland of over nine months, I am fully confirmed in my opinion that the selection is the best that could be made, and I recommend the passage of the resolution which your committee will submit at the proper time, making Cleveland the headquarters of this Grand International Division of the Brotherhood of Locomotive Engineers, for ten years, from the first day of January, 1870.

Agreeable to the instructions of your last Grand International Convention, I have made considerable inquiry as to the possibility of obtaining an act of incorporation both by the United States and a single State. The general opinion expressed by the Hon. Noah Davis, Member of Congress from the Twenty-eighth District of New York, and several learned gentlemen of the City of Cleveland, is that we could accomplish all we desire by a State law. But it was not thought advisable to incur any expense in drafting a bill, or making further investigations, until you determined where you would permanently locate your headquarters. From information received in the correspondence and conversations I have had, I have no doubt but what an act of incorporation could be obtained in a State that would make the Grand International a legal body, and confer power upon them to issue charters to parties in other States that would be held as legal bodies by the law of comity.

I recommend that the Grand Chief and First Grand Assistant Engineer be authorized to employ counsel, and, if practicable, to try and obtain an act of incorporation that will enable the Grand International, and all sub-divisions working under the authority of the Grand International, to require legal bonds of their officials for the safe keeping of all their funds.

During the past year efforts have been made in several States to procure a license law for locomotive engineers. Every man that has charge of a steam engine or boiler should be a sober, temperate man. If it is necessary to enforce this provision by law, then I do not think it will meet with much opposition.

In my judgment the only true way to determine the qualifications of a locomotive engineer is by a practical demonstration of his abilities; and the persons best qualified to judge of his merits are those that are daily associated and employed with him. Hence I claim that a certificate from a sub-division of our Brotherhood, certifying that the bearer is a first-class engineer, is the best possible evidence of his ability that he could obtain. If all sub-divisions would act honestly and sustain only such men as are worthy and of good ability, their recommendations would be a far better endorsement of the bearer than any license certificate that could be granted. But brothers must not be surprised at the distrust of railway officials, so long as unworthy men are sustained.

The plan of promotions inaugurated on many of the leading railroads is the best incentive that could be devised to stimulate engineers and firemen to the faithful performance of their respective duties. Some one may say that the rule is a good one to promote in turn, according to time of service, but all the companies reserve the right to judge of the qualification, and as a matter of course they promote only such as they consider competent and worthy. Now, I ask, will any man pretend that it would be right to make promotions without any regard to merit. If they did there would not be any incentive motive for improvement. The tippler, the careless, and the incompetent man would all stand on a level with the sober, careful and thoroughly competent man. This reservation in regard to qualifications is the best part of the rule, and it is a sure guarantee that the person entitled to promotion will surely obtain it when his turn comes, provided his record is clear and his ability sufficient. The carrying out of this rule of promotion in turn is entirely in the hands of the engineer, and if in any instance its requirements are not regarded, the engineers upon any road in the country have moral influence enough to

induce their officials to give all promotions to such as are entitled to them.

This plan, once fairly established, will stop all intriguing for place and do more to establish harmony amongst engineers than any other plan that can be devised. No fears need be entertained by the officials that the engineers will try to induce them to promote unworthy men. If the whole matter was left to the engineers, in my opinion, they would be much more rigid in regard to promotions than officials; they have the means of knowing all the little faults of their associates that have escaped the observations of the officials, and they would be very careful to promote none but such as were competent and reliable. This system of promotion is the best guarantee to the fireman that could be contrived, and it is all the incentive he needs to induce him to attend faithfully to his duties, and to make himself proficient in all he will be required to do when his turn comes for promotion. The engineers being so intimately associated with their firemen, should be willing on all occasions to use their influence to obtain for them all the rights their good conduct may entitle them to.

The Brotherhood have better facilities for knowing the abilities of applicants for membership than any system of license that could be devised; and our Constitution makes it the duty, first, for three members to certify, in writing, that they are personally acquainted with the applicant, and that he is a man of good moral character, and in their belief, if admitted, will make a worthy member of the Brotherhood. Now, it is not to be supposed that a man with no ability as an engineer would make a worthy brother. But to make this more sure, the Chief Engineer must appoint a committee of three members, whose duty it shall be to investigate the character, ability, and standing of the applicant. I ask what plan could be devised to more thoroughly canvass a man's merits than to pass the rigid scrutiny of six of his intimate associates, and after all this be liable to rejection by any three members of the division where he applies for membership. Some advocate of a license law may contend that this rule is not strictly observed. My reply is that it will not require a member with but little influence to control three votes on any occasion when the honor of his Division is at stake. This feature in our rules, faithfully carried out, must satisfy the most fastidious in regard to having engineers that are qualified. As regards obtaining any strength by virtue of a license, in case of disagreement with railroad officials, I think that it is all visionary; there would always be a large surplus of engineers that would be able to obtain a license, and that would be as ready to occupy your places in case of trouble as any men that can be found at the present time.

No, my brothers, you have no necessity to make any preparation for trouble or hard times, except to rely solely upon your merits. You can make your claims a thousand fold more potent by enlisting the sympathy of all railroad officials and the public on your side. And unless you are able to show advantages in employing such men as you profess to be, you have no good grounds to expect success. But we all believe that our Brotherhood has been the means of elevating and improving the ability and standing of locomotive engineers; and we further believe that all railroad managers and officials will use their engineers much better, and pay them more wages, if they are convinced that the engineers are doing their best to serve the interests of the railroad companies. There is no bond in this life so strong as friendship, but if we are able to not only maintain the friendship of our employers, but in addition to their friendship be able to demonstrate to them the pecuniary advantages of having reliable engineers under all circumstances, then we shall have gained our point, and undoubtedly shall be well paid for all our efforts for improvement.

Radical measures were tried by a society of engineers, under another name, and all confessed the effort a miserable failure. The Brotherhood of Locomotive Engineers, profiting by their example, have overcome the most bitter prejudices and now are near the summit of their ambition. And I am unable to see any necessity for a change in our policy. Our main efforts have been to improve our abilities and promote harmony between employer and employee. Our rapid progress under this policy has been beyond precedent in any similar organization and beyond the most sanguine expectations of the warmest friends of the Brotherhood. Brothers, I entreat you and counsel you by every consideration to maintain your present peaceful policy; it has been sufficient to overcome the most influential and bitter opposition; it has secured for you the influence of the most wealthy and influential railroad managers in the country; it has secured the recognition and support of the press; and it has secured a hearty God speed from all true friends of progress, and of the public at large. It is sure, if continued, to be an unerring passport to the goal of your ambition. I repeat my advice, to never put off a certainty for an uncertainty.

I recommend that this Grand International Division pass a by-law making it the duty of all sub-divisions to see the members each year of the different State Legislatures in their locality, and request of them to be informed immediately of the introduction of any bill in their respective Legislatures, for the purpose of licensing locomotive engineers. I also recommend to this convention that they devise some plan to decide the merits of any such license law that may be introduced, with instructions to the various sub-divisions how to proceed to defeat the same, if found objectionable.

Brothers, my official term of office expires at this session. This closes my sixth year of service in this office, having been honored as your Grand Chief during the entire period of the existence of the Brotherhood of Locomotive Engineers. It cannot be wondered at that some mistakes should have been made; but I can assure you that they were mistakes of the head, not of the heart. My sole ambition has been to use my utmost influence to make this organization a lasting benefit to locomotive engineers, and a society that should be

honored as highly as any in the land. How well I have succeeded I leave to others to judge. But I feel that I can now retire with the proud consciousness of having performed my duty to the best of my ability.

The Construction of Locomotive Engines.

Eighteen hundred men make a locomotive engine in one day—boiler, cylinders, frame, driving-wheels, truck, stack, cab, pilot and tender complete—the speed of forty miles an hour and the power of a thousand tons created in a day.

On the 25th of April, 1831, a miniature locomotive engine, drawing two cars with seats for four persons, was set in motion on a track laid in the rooms of "Peale's Museum," in the city of Philadelphia. Great numbers of people, not only from the city but from distant parts, visited the Museum to witness the performance of this wonderful machine. Previous to that date only three attempts had been made in the construction of locomotives by American mechanics. Two engines, the "Phoenix" and the "West Point" had been built at the West Point Foundry, 1830, for the South Carolina Railroad, and a third, the "De Witt Clinton," for the Mohawk & Hudson Railroad, was completed in the spring of 1831. Two locomotive engines had been imported from England, one in 1828, for the Carbondale & Honesdale Railroad in Pennsylvania, and another for the Mohawk & Hudson road, in 1830. The little engine amusing the visitors at Peale's Museum was the invention and work of Mr. Matthias W. Baldwin, then a skillful and enterprising mechanic of Philadelphia.

In the following year Mr. Baldwin received an order from the Germantown Railroad Company for the construction of a locomotive engine to run on their road. This was, at the time, a very formidable undertaking. Only one mechanic in America had yet succeeded in erecting a locomotive that would draw more than its own weight on a horizontal track. Several unsuccessful attempts had been made, resulting in loss and discouragement to the experimenters. However, Mr. Baldwin had confidence in his ability to surmount all difficulties, and he agreed to build the engine. Without tools, patterns, or models, he entered upon the work with only his genius to guide him, and on the 23d of November, six months after receiving the order, he placed the "Ironside" on the road. Its success and the sensation which it produced are now matters of history. It is enough to say that it established a reputation for its builder that secured for him more work than the capacity of his shop could accommodate. Before the close of 1834 he had completed five engines. New shops were erected, and in 1835 fourteen locomotives were built; in 1836, forty; and in the next year, forty-five. The business was, therefore, fully established and grew from year to year, experiencing with other departments of manufacture and trade periodical revulsions, but yet moving forward until the "Baldwin Locomotive Works" assumed and maintained the enviable distinction of being the most extensive locomotive establishment in the world, and from the capacity of one small engine in six months, the works, within a third of a century, attained the capacity of one engine a day, or over three hundred of the most powerful and complete railroad locomotives in a year.

One of the secrets of the great success of the works lay in the genius of their founder. Mr. Baldwin was gifted with a mind fertile in practical inventions to a degree rarely found in any country. During the earlier years of his experience as a locomotive builder, almost every engine produced was in some particular an improvement over any of its predecessors, many new devices or changes in combination giving increased strength, durability, and general efficiency to his machines. The first great improvement in his engines was the invention of the "ground joint," which superseded the old canvass and red lead joints then in use. The device of the half crank axle, by which an inside connected engine with outside cylinders was made possible; the flexible parallel-beam truck for the two forward pairs of drivers on the old pattern of freight locomotive with four pairs of drivers, and the arrangement, in connection with it, of coupling all the wheels in such a manner as still to permit a free and flexible action on curves and undulations in the track—these are some of the major improvements in locomotive building which were introduced by Mr. Baldwin. The device last named has since been superseded, but at that time it was an important step in the direction of the present flexible machines. Among the minor inventions may be named the forming of the pump-chamber within the guide-bar, and the use of the iron wheel center with wood fillings between rim and tire. This latter device was patented by Mr. Baldwin in 1835. The copper ferule-band, on the opposite side of the fire-box end of locomotive tubes, was also patented by Mr. Baldwin in the same year. All the Baldwin patents taken out before the burning of the Patent Office building at Washington, 1836, were suffered to expire, as no effort was made to renew the records. Some of these, as the two last named, were afterwards patented by other inventors. Many of the most valuable improvements made by this thoroughly liberal mechanic were not reserved to his own use by patents, but were given to the public; more reliance being placed in superiority of skill and workmanship than in letters patent to maintain the leadership in American production. The Baldwin Locomotive Works are located on North Broad st., Philadelphia, and occupy the greater part of three blocks, from Pennsylvania avenue to Spring Garden street, and an area of 240,000 square feet. On the centre of the Broad street front stands the old shop, three stories in height, erected by Mr. Baldwin in 1834. Here are the offices, store-room, and drawing department, and also what is called the Hamilton street shops, including boiler shop, smith shop, brass foundry, "first, second, and third story machine shops," and pattern loft. South of this building is the Willow street shop, where cylinders and frames are finished, and tanks, trucks, stacks and cabs are made. Adjacent to this building on the west is a brick building 266 feet long, 60 feet deep in the central part, and with two wings 108 feet deep at either end. The central part of the building and the east wing are used for the iron foundry, where all the cast-iron work used about a locomotive, except the truck-wheels, is made. The west wing is used as a hammer shop. One large steam hammer, rated at five thousand pounds, is in constant use here, working up scrap and bar iron into blooms from which the engine frames are made. On the north side, beyond Buttonwood street, is the erecting shop, whither all parts tend, and whence complete locomotives emerge. Two large buildings and a lot of ground, detached from the main establishment, are employed as a blacksmith shop, stable, and storage-room, not enumerated in the above.

The different varieties of locomotives usually manufactured in the establishment are technically designated in the Baldwin classification by certain letters and numbers. The letters indicate the plan or kind of engine; the numbers, the size or weight. The combination of the letters and numbers indicates precisely the class. To explain more clearly: The letter B is used to designate all engines having a single pair of drivers; C, those with two pairs of drivers; D, those with three; and E, those with four pairs of drivers connected. Then certain numbers, now merely arbitrary, but originally intended to indicate the weight of the machine in gross tons, are joined with the letters, and the combination designates a particular plan and size of locomotive. The ordinary type of the American locomotive, it is well known, is an engine on eight wheels, four of them under the fire-box part of the machine, and acting as "drivers," and four smaller wheels combined into a truck to carry the forward part of the engine. Such an engine, in the Baldwin technology, would be a "C" engine, by virtue of its having two pairs of drivers connected. If its cylinders are sixteen inches in diameter, the boiler must be large enough to furnish them with steam, and all the other parts of the machine must conform in size. The aggregate weight of the engine is accordingly governed by the dimensions of the cylinders. Now the figures 27½ indicate these facts. We have then the combination 27½ C to designate a locomotive with eight wheels, four of them drivers, with cylinders sixteen inches in diameter, and a certain aggregate weight for the whole machine. In like manner all the other classes of engines are appropriately designated.

More definitely for the benefit of the profession and of those who, like Mr. Gradgrind, delight in absolute "facts," we may tabulate the different classes of engines covered by their designs and practice, as follows:

Class.	Whole No. of Wheels.	Service.	Cylinder.	Drivers.		Remarks.
				No.	Diameter.	
7 B	6	Passenger	7x14	2	42	Built with tank on boiler or separate tender
6 C	4	Mining	9x12	4	30	
8 C	4	Shifting	9x16	4	36	
10½ C	4	Shifting	11x16	4	36	
14 C	4	Shifting	14x22	4	48	
14½ C	6	Shifting	14x22	4	48	
15 C	8	Light Passenger	10x20	4	54	Road Engines.
16½ C	8	Light Passenger	12x22	4	54 to 60	Road Engines.
20½ C	8	Light Passenger	12x24	4	56 to 66	Road Engines.
22½ C	8	Passenger or Freight	14x22	4	56 to 66	Road Engines.
24½ C	8	Passenger or Freight	15x22	4	56 to 66	Road Engines.
27½ C	8	Passenger or Freight	16x22	4	56 to 66	Road Engines.
28 C	8	Passenger or Freight	17x22	4	56 to 66	Road Engines.
27½ D	8	Freight or Pusher	16x22	6	48	"Mogul" Pattern.
25½ D	8	Freight or Pusher	17x22	6	50	"Mogul" Pattern.
30 D	8	Freight or Pusher	18x22	6	48 to 54	"Mogul" Pattern.
24½ D	10	Freight	16x22	6	48 to 54	"Ten-Wheel" "
26½ D	10	Freight	17x22	6	48 to 54	"Ten-Wheel" "
28½ D	10	Freight	18x24	6	48 to 54	"Ten-Wheel" "
34 E	10	Freight or Pusher	20x24	8	48	"Consolidation" "

From these classes and varieties the customer makes a choice. Perhaps because of some special service, special modifications are required; these are noted, and the price is agreed upon. The purchaser goes to his home, and his order to the "drawing department." Here the engine is, as it were, analyzed and dissected. The proposed machine, existing as yet only in imagination, must be composed, it is found, of a certain definite number of parts. The smith-shop accordingly receives a written order, in a book provided for the purpose, to make the forgings; the foundry, the castings, the boiler-shop, the boiler, and so on. The several machine shops also have their orders to fit up and finish these several parts which may come to them from the other departments. But not only in this bare order to do the work thus made, the manner in which it is to be done is also provided for. Drawings and patterns are already in existence for every one of the parts to be constructed, unless the engine is of a class never before built. These drawings and patterns all have their separate distinguishing numbers. Each order for the production of any part, or for the finishing or fitting of it, bears also the number of the drawing or pattern to which the work is to be done. These order-books and the necessary plans and patterns now go to the several departments, and with the fulfillment of the orders which they communicate must result all the parts required for the complete locomotive.

Following these orders we are led first to the boiler-shop. Here the sheets of iron or steel, as the case may

be, are laid out. Both materials are now used for boilers, according to the preference of customers. The homogeneous cast steel manufactured in this country, and which has come into use within the past few years, gives a metal for fire-boxes and boilers which is surpassed by no other yet used for the purpose. To the credit of American manufactures it may be said, moreover, that for these uses the homogeneous cast steel plates manufactured in the United States are superior to any steel which can be imported. The steel plates used for boilers are 5-16 of an inch thick; iron plates are $\frac{3}{8}$. The former, although thinner, give, on account of the superior character of the metal, a tensile strength of about 30 per cent. greater than the $\frac{3}{8}$ -inch iron plates. For fire-boxes steel has now almost entirely superseded all other metals. For boilers it is gradually but slowly coming into use. The first cost for a steel boiler is from \$250 to \$500 greater than for iron, but the superior strength and durability of those made of steel plate fully warrant the expenditure, in the judgment of many railroad officers.

Before being put into a boiler, every sheet, whether of steel or iron, is carefully tested, and the slightest flaw or imperfection in the metal is at once detected by the expert who devotes his whole attention to this important duty. If tried and not found wanting, the great jaws of steam shears cut them to the required size; four great flange fires then receive them, where they are softened so as to be pressed and beaten into the proper curve; the steam punching machines or the drilling machines, as the case may be, perforate the edges with holes of exact size, form, and equidistant; then with the hammer and tongs the sheets are tacked together by an occasional rivet, a powerful crane takes the skeleton up and delivers it to the steam riveting machine, where every rivet is clenched under three strokes of 60,000 pounds each. The precision and power with which this machine does its work is a marvel of mechanical skill.

The "fire-box" having gone through a similar process now meets the "shell of the boiler," and the two are joined firmly together by screw staybolts; the waist or cylindrical part is then attached, and the boiler is complete. It is placed upon wheel-trucks and sent over a track to the erecting shop.

In the same time that it requires to do this work in the boiler shop, by an exact distribution of force, the workmen in the foundry have drawn the liquid metal from their roaring furnaces, have cast it into forms for cylinders, driving-wheel centers, chests, valves, etc. These, received in the Willow street machine shop, have been bored, planed, heads turned and ground to a perfect fit, and, as complete cylinders and steam-chests, are sent to the erecting shop. The drivers are sent from the foundry to the first-floor machine shop; the axles, forged under a heavy steam hammer, are delivered to the same place. The tires for many of these drivers are made at "The Wm. Butcher Steel Works," at Newtown, and are pronounced, by competent judges, equal to the best imported. Seven thousand have been in use, some in hard use for several years, and give entire satisfaction. Note this fact to the credit of American steel manufacture. The crank-pins are received in the rough from the Baldwin & Liveszey Steel Works, Frankford. In the machine shops the tires are bored and shrunk on the centers of the drivers, the axles and pins are turned, the tires are shaved down to exact equality of size, the axles and crank-pins are forced into the wheels by hydraulic pressure of from 20 to 80 tons, and the drivers complete are sent to the erecting shop. The truck wheels go through the same process, and are sent to the erecting shop.

Under the ponderous strokes of the steam-hammer of 2½ tons power, great iron frames are forged out, and pedestals are welded to them under the same weight. These frames are roughly dressed up by hand in the smith shop; they are then taken to the Willow street shop, where they are planed, slotted, drilled, and completed in every part. The "frame" is the basis or foundation to which all the parts of the locomotive are bound. It, too, is sent to the erecting shop. Meantime the trucks, smoke-stacks, cabs, and tenders have been made in their respective departments, and are ready for the engine proper.

Having thus made the tour of the construction department, we now enter the erecting shop, that general receptacle where all parts are received and whence issue complete locomotives destined for all parts of the continent. Here in an area 168 feet long by 140 wide, under an arched roof, netted with steam-pipe, water-pipe, and suspended tracks, the parts prepared in other departments of the establishment are brought together. Boilers, cylinders, frames, guides, crossheads, drivers, and other articles innumerable, are here tossed together in what, to the unpracticed eye, seems inextricable confusion. Upon closer inspection it is found that every article has plainly marked upon it the letter and number of the engine of which it is to form a part. We find here twenty or more boilers mounted on trestles, gangs of men at work, managed by as many master mechanics, under the direction of the foreman of the shop, the whole under the supervision of the superintendent of construction. To these boilers the parts are brought and attached; and, what is most marvelous, here are bolts made in one part of the works to be inserted into holes made in another; bars, screws, pins, yokes, etc., fit to such exactness that the thinnest film of oil is an obstruction. The wonder is how such absolute precision is possible in an establishment employing nearly two thousand men, distributed throughout different shops. Upon expressing surprise at this circumstance, I was taken to the department of "standard measurements." There I saw gauges made of hardened steel for the measurement of every fraction of an inch, gauges for turning bolts, for boring holes, for cutting threads or screws, for planing surfaces; gauges for reamers, for crossheads, for bolts and bolt-heads. Also calipers for every length of inside and outside measurement required in the works. Each department is sup-

plied with a complete set of these gauges and calipers required for the measurement of the parts made therein; and these are carefully inspected and compared with the standard once a week by the superintendent of this department. There is thus no excuse for any workman who makes his bolt, bar or screw too long or too short, too thick or too thin, and such blunders are exceedingly rare. This is the clue to the marvelous exactness in all the work. If an engineer in Oregon should telegraph to the Baldwin Locomotive Works that the piston-rod or crosshead of locomotive No. 2,300 is broken, a duplicate, certain to fit with absolute exactness, could be forwarded at once.

The system of standard gauges, together with the plan of doing all work to drawings or patterns, explains why an establishment of its size can not only build so many engines in a year, but can turn out machines in which the parts are so accurately finished and absolutely interchangeable. A complete system and thorough sub-division of the work reveal the secret. The same gang of men under the same foreman works from one year's end to another on the same work, as fitting up rods, boring out and finishing cylinders, fitting the valves, or putting the engine together when all the parts are completed. Each man having only his speciality to attend to, becomes thoroughly an expert at its details, and can do his work better and faster for this very reason. In fact, the very quantity of the work produced in itself conspires to exactness in all the details, by making possible a complete system and thorough subdivision of labor.

But from this digression let us return to the erecting shop. One of the gangs has carried the erection of the engine under its charge to that point where trial is made. No boiler is riveted perfectly steam-tight under the first process. Each undergoes inspection, first under water pressure so as to detect leaks, and after that under steam pressure so as to insure strength. This duty in the Baldwin Works is committed to an expert who, by many years' experience, has acquired such perfect knowledge in his speciality as to make it, humanly speaking, impossible that any imperfection of construction should escape his detection. Strength and tightness are thus secured in all the boilers. The parts are finally connected, a strong puff of steam is sent through the pipes, valves, cylinders, and escapes, so as to blow out any iron filings, chips, or other loose matter, the cylinder-heads are then bolted to the cylinders. The men lay hold of the drivers and turn them two revolutions forwards and backwards to ascertain whether any obstructions exist. Finally steam conveyed through pipes beneath the roof is let on, the valves are opened and the drivers revolve, at first slowly, then at fair "service speed." The inspector is again present; he lays his finger on the piston rod, connecting arms, drivers, and cylinder heads, and, feeling the pulse of the new machine, detects the slightest jar, tremor, or irregularity in motion, and orders its correction with infinitely more exactness than the most skillful practitioner discovers, and cures the disorders of his human patient. The locomotive is then pronounced complete, it is so entered upon the books of the firm; the trestle-work is removed, and the engine is lowered by means of powerful "jacks" to the track on the turn-table, whence it is run out on the siding of the Reading Railroad to be shipped to the place designated by the purchaser.

During the past twelve months two hundred and seventy-one complete locomotives have been sent from this shop, as follows: In October, 1869, 22; in November, 26; in December, 23; in January, 1870, 21; in February, 21; in March, 21; in April, 21; in May, 23; in June, 23; in July, 23; in August, 24; in September, 24. This is certainly a decided progress from the five engines turned out by Mr. Baldwin in 1835. But the progress which has been made in the methods of construction, resulting in increased efficiency, strength, speed, economy in fuel, and in repairs, is no less wonderful. The archives of the establishment, containing as they do communications covering a period of thirty-five years, and in the handwriting of railroad managers, engineers and master mechanics, are not only a reflex of the general progress of railroad practice, but bear strong testimony to the efficiency and durability and superior workmanship for which the Baldwin engine has achieved an enviable reputation. An acquaintance with the personnel of the firm will compel the conviction that this reputation is well deserved. Mr. M. W. Baldwin conducted the business of locomotive building in person from 1831 to 1839. In 1839 he associated with himself Messrs. Vail and Hufty, and the business was conducted by the firm of Baldwin, Vail & Hufty until 1841, when the latter withdrew, and Baldwin & Vail continued the copartnership until 1842. In that year Mr. Vail retired, and Mr. Asa Whitney, who had been superintendent of the Mohawk & Hudson Railroad, became a partner with Mr. Baldwin until 1846, when he retired, to engage in the manufacture of car wheels, with which business he is still connected as senior member of the firm of A. Whitney & Sons, Philadelphia. From 1846 to 1854, Mr. Baldwin was sole proprietor of the establishment; and, in the latter year Matthew Baird, a practical mechanic and successful manufacturer, who had been connected with the establishment since 1836, joined Mr. Baldwin under the firm name of M. W. Baldwin & Co. In 1866 Mr. Baldwin died, and in the following year the business was reorganized, and the works designated the Baldwin Locomotive Works, M. Baird & Co., proprietors. George Burnham and Charles T. Parry were admitted to the copartnership; and three years later, January, 1870; Edward H. Williams, William P. Henszey, and Edward Longstreth became members of the firm. Here are six active, practical experienced men, each in charge of a department the operations of which he thoroughly understands. Mr. Baird, by reason of a long and intimate acquaintance with the trade, practical experience as a manufacturer, wealth, and social position, rightfully is the head of the establishment, and is referred to in all matters of importance, both in the production and selling of engines. Mr. Burnham has, since 1838, been in the counting-

room; he is properly, therefore, the financial manager, holds the keys of the vaults, looks after the bank account, and takes care of the exchequer, which in an establishment doing a business to the amount of three and a half million dollars annually, is by no means an ordinary responsibility. Mr. Parry, who began service here in 1836, now holds the general supervision of the works of the eighteen hundred men employed, of the condition and order of the shops, materials brought in, and manufactures sent out; no general of an army has his subordinates under more perfect discipline, nor his supplies more punctually, precisely where needed, than has the generalissimo of these works the men and things under his charge. Mr. Williams is a "railroad man," with eighteen years' experience in the management of the best conducted roads in the United States; his knowledge of what is required in actual service enables him to put into the construction of engines special adaptability to special service. His acquaintance with active railroad men and the experimental knowledge of their needs, enables him intelligently to receive and apply their suggestions in the detail of their orders. Mr. Henszey is the chief of the drawing department, with fifteen years' experience as a mechanical engineer. All orders for work, as related above, are received by him and distributed from his department to all the shops. Mr. Longstreth, thirteen years ago, entered the works an apprentice in the machine shops, and before the end of his apprenticeship was made foreman of one of the shops. He is now the superintendent of construction, ordering and overseeing the work in every department. Under these are private secretaries, book-keepers, draughtsmen, assistants, foremen, managers, inspectors, bosses, and watchmen, who see that orders are delivered and obeyed with precision and dispatch. This explains why, in so large an establishment, doing business so extensive, machines are produced so uniform in quality and so satisfactory in service.

We cannot leave this subject without a word of comment on the lesson it teaches, as to the value of American manufactures and the importance of fostering and protecting them.

Here is an establishment, the value of the finished products of which, in 1869, was \$3,430,018.84. Of this sum, \$1,068,388.20 was expended for labor, giving employment to 1,600 or 1,700 men, and, if we allow 5 persons to a family, furnishing a support for a population of 8,000 to 9,000 souls—no inconsiderable portion of the population of Philadelphia. But, further, the remaining two and a half millions represent the amount expended for materials for tools, for railroad, canal, and steamer freights, for the innumerable incidental expenses of carrying on such a business, and for the return on the capital invested. But of this expenditure for material, bought and used in the manufacture of locomotives, all, without an exception save some few articles not produced in this country, are exclusively American products or American manufactures. American boiler-plate, American steel, American pig and bar iron, American lumber, American coal, American copper, and American brass, are the principal materials from which the Baldwin Locomotive Works construct their machines. All these articles, as they come to the works, represent in their cost price principally Labor, and American Labor at that—labor in mining coal, in smelting iron, in rolling boilerplate, in cutting and sawing lumber, &c. If we go back to the absolute first-cost, or the royalty, for the coal and ore in the ground, and the lumber in the forests, as we logically may, we shall have but a few thousand dollars as the original first-cost for the raw material, which mined, smelted, cast, forged, planed, turned, finished, and polished, stands finally on the books at an aggregate value of nearly three and a half millions of dollars, and in its various stages of transformation and progress has given employment to probably six thousand men, and supported a population of thirty thousand souls.

These facts speak for themselves. But still another consideration is to be added: America competes with England in the manufacture of locomotives for foreign countries. Baldwin engines are at work in Germany, in Canada, in Cuba, in Brazil, in Peru, and in the Argentine Republic, and have been placed there, if not at less cost, at least as cheaply as English locomotives could have been. But English iron is only a fraction of the cost of American iron, and English labor brings wages barely sufficient to keep soul and body together. English pig iron costs to-day \$14 to \$16 per ton; American pig iron, \$32 to \$33 per ton. With equal prices for locomotives and machinery in the two countries, what is the inference? Clearly that, while in Europe capital extorts the lion's share as its return, here, where wages and the cost of material are both so much higher, it is Labor—adequately paid, making possible comfortable homes, education, self-improvement, self-respect, and an intelligent citizenship—which stands foremost in the value of the finished product.—*Correspondence New York Tribune, Oct. 31.*

—The case of J. O. Cunningham and Eugene Johnson vs. the Illinois Central Railroad Company, was tried before the Champaign County Circuit Court last week, and a judgment of \$500 damages rendered to each of the plaintiffs.

It was proven that the plaintiffs were en route to Rantoul on legal business; that they went to the ticket office of the Illinois Central Railroad Company to purchase tickets, at a time when the company advertised to keep the office open, and found it closed. Failing to obtain tickets, they got on board a freight train, and tendered the money to pay their passage, but the conductor refused to take their money, stopped the train, and compelled them to get off half a mile north of the Champaign station.—*Champaign (Ill.) Gazette.*

General Railroad News.

OLD AND NEW ROADS.

Intercolonial Railway.

The commissioners have gone over the route, and inspected the works now in progress. They express themselves as generally well satisfied with the operations of the different contractors, though one or two of them are censured. The Commissioners believe that the track may be laid upon the greater part, if not the whole of the following sections, by the close of next year: Sections Nos. 1, 2, 5 and 8, in Quebec—86 miles. Nos. 3, 6, 9 and 15, in New Brunswick—79 miles. Nos. 4, 7 and 12, in Nova Scotia—73 miles. Total 238 miles. Tenders for steel rails have been advertised for, deliverable in spring, and tenders for ties will be asked for, deliverable in winter. It is hoped the whole right of way will be secured by the end of the present year.

Alexandria & Fredericksburg.

The Alexandria *Gazette* says that Mr. Geo. B. Roberts, President of this company, is understood to have disapproved the route of the road, for the construction of which bids have been made, and that probably an entirely new line, running considerably west of the former location, will be adopted, and that engineers will commence surveying it immediately.

Cleveland, Mt. Vernon & Delaware.

This railroad, which is in operation from Hudson (26 miles southeast of Cleveland on the Cleveland & Pittsburgh road) southwestward through Akron and Orrville to Millersburg, 61 miles, was intended originally to extend from Millersburg to Delaware, which is 25 miles further south and 73 miles further west. Now, however, it is proposed to make the terminus at Columbus, which is 30 miles south of Delaware. The line would cross the Lake Erie Division of the Baltimore & Ohio at Mt. Vernon.

Detroit & Illinois.

On the 14th inst., Michael Sickafosse, Secretary of the Detroit & Illinois Railway Company, filed with the Secretary of State of Indiana the following copy of a preamble and resolution, passed at a meeting of the Board of Directors of said company, held September 1, 1870, at Columbia City, Ind.:

WHEREAS, This Company has vested in it the right of franchises of the Logansport & Northern Indiana Railway Company, and the rights and franchises of the Toledo & Logansport, and Northern Indiana Railway Company, by purchase of transfers; therefore,

Resolved, That this Company adopt as their own said maps and profiles, and do now locate their road, in every respect, upon the line as indicated on said maps and profiles.

St. Paul & Chicago.

That portion of the road between St. Paul and Red Wing was completed and formally "opened" last week. The Minneapolis *Tribune* gives this information concerning it: "From St. Paul to a point on the river opposite to Hastings, the road runs nearly on an air line, the whole distance being nineteen and one-tenth miles. At Hastings an iron bridge, six hundred feet long, is to be constructed, upon which work is already begun, the cost of which is estimated at \$200,000. It is to be built with three piers and an improved draw. The distance from Hastings to Red Wing is twenty-one miles, and the last work of laying the rails and getting them in readiness for trains, was this week accomplished. Work along the whole line of the road will be continued through the winter. There will be finished this year fourteen miles from Minnesota City to the north bank of White River. It is sixty-three miles from Winona to Red Wing. The completion of the whole line will shorten the time between Minneapolis and Chicago at least between three and four hours."

Lawrence & Paola.

A charter has been granted to this Kansas company for building a road from Lawrence southeast to Paola, the county seat of Miami county. The incorporators are: Elijah Sells and L. J. Dallas, Baldwin City; H. J. Canniff, Prairie City; P. P. Elder, Ottawa; G. W. Mitchler and Capt. Shannon, Paola; Gurdon Grovener, P. D. Ridenour, Wm. H. Sells, Wm. M. Hazeltine, W. C. Ransom and James S. Crew, Lawrence; and H. M. Brockway, Wellsville.

Portland & Ogdensburg.

The track on this railroad was laid to Steep Falls, a distance of 24½ miles on the 28th ult., and the trains commenced running there on the 7th inst.

Houlton Branch.

This new railroad, the first to penetrate into Aroostook county, Me., was opened with an excursion on the 9th inst.

Piqua, St. Mary's & Celina.

A company with this name has been incorporated in Ohio to construct a railroad from Piqua (88 miles north

of Cincinnati) on the Dayton & Michigan Railroad) northward about 30 miles and thence west ten miles to Celina. It is hoped to make it a link in a line from Cincinnati to Mackinaw.

Portland & Rochester.

The annual meeting of this company was held at Portland, Oct. 4. The report of the President says that the road will be completed to Rochester by the 1st of January next, and congratulates the stockholders upon the prospect of two through routes from Rochester, viz: by Nashua and Concord. He says that two-thirds of the amount required to build the roads between Rochester and Nashua and Rochester and Concord is already pledged.

Chicago & Iowa.

Track laying commenced on the Chicago & Iowa Railroad at Aurora on the 2d inst., a construction train being used for the first time off the Chicago, Burlington & Quincy track. It is expected to lay two miles a day, and the distance being about forty-four miles, we may reasonably hope to see the construction train in Rochelle by the fifteenth of December, making due allowance for an average amount of bad weather. The grading is completed with the exception of two miles in this town, which will be but a short job when a large force is put to work. There is reason to believe that by New Year's Day the road will be completed to Oregon. Still there is a large amount of work yet to do. There are at least two bridges between here and Oregon, each four hundred feet long, yet to be built, and we suppose the material for them will be transported over the line, so they cannot be built in advance of the iron-laying. But we are told the bridging is all framed and ready to be put up as soon as transportation is furnished. Everything connected with the enterprise now looks to the early completion of the road.—*Rochelle Register*.

Danville, Olney & Ohio River.

Articles of consolidation between this and the Harrisburg & Great Northern companies were signed at Olney on the 19th ult. Some grading on the former line has been done this season.

Denver & Boulder Valley.

Work is actively progressing on the Denver & Boulder Valley Railroad. Fourteen miles are to be completed this fall.

Brookline & Lexington.

A Massachusetts correspondent writes us that a scheme for a railroad from Brookline, N. H., through Pepperell, Mass., to Lexington, Mass., to connect with the Boston & Lexington Railroad, has been started, and is progressing as fast as circumstances will permit. The line is partially surveyed, and more than one-half of the stock is guaranteed for the construction of the road by one of the wealthiest railroads in Massachusetts. The distance is about 30 miles, and when finished the road will be very advantageous to the country along the route.

Canada Southern.

The Buffalo *Express* says that circumstances indicate that this railroad will be constructed, as well as the Canada Air Line, which the Great Western is constructing. The two roads for a hundred miles or more will be only a few miles apart.

Ironton & Dayton.

Engineers are surveying a route for a new railroad in Southern Ohio, to extend from Dayton southeastward, crossing the Little Miami at Spring Valley, the Cincinnati & Zanesville at Wilmington, the Marietta & Cincinnati at Vienna, touching the Blanchester & Hillsboro Branch of the latter at Hillsboro, and its Hamden & Portsmouth Branch close to the Ohio near Portsmouth, and having its terminus on the Ohio at or near Ironton, whence a line a few miles long in Kentucky would connect with the Chesapeake & Ohio. This would form a part of a short line between Chicago and Norfolk.

Quincy, Alton & St. Louis.

We are informed that Messrs. Wood, Wright & Co., of Pennsylvania, have agreed to build the road from Quincy to St. Louis; forty miles of which are to be completed, and in running order, and well stocked, by the 31st of December, 1871. Iron for the first forty miles is to be delivered by the 1st of May next. The location of the road is left to the engineer-in-chief, who is to select the most practicable route. The contractors are to have the road six months after its completion, when it will be turned over to the company.

Dubuque, Bellevue & Mississippi.

The company last week let another contract for grading to John Hays & Co., concerning which the Dubuque *Telegraph* says: "The new letting is just below the city, commencing at the turn westward of the Dubuque & Sioux City road, and extending down to the old grading of the Tete des Morts branch of the Dubuque & Pacific road."

Mississippi & Missouri Air Line.

Two locomotives and nine car-loads of iron crossed the river at Quincy on the 15th inst. for the Mississippi & Missouri Air Line Railroad, and track-laying has been commenced at West Quincy.

Kansas Roads.

Osage county is agitated just now with the proposition to issue \$250,000 in bonds for seventy miles more railroad; one from Lawrence up the Wakarusa to Carbondale; one from Ottawa, through the south part of Osage, to Emporia; and the other from Ottawa, by Quenemo, to Burlingame, and northwesterly by Eskridge to Junction City, with a branch to Alma and Manhattan; the latter road being designed as nearly a straight line from St. Louis to Denver.

The Neosho Falls *Advertiser* says the survey of the Fort Scott, Iola & Neosho Falls Railway is to be made immediately, under the direction of the Missouri, Kansas & Texas Company.

Maine Railroads.

On the 3d inst. the first steps were taken for the operation as one line of the Portland & Kennebec and the Maine Central railroads, the latter extending from Danville junction, 28 miles north of Portland on the line of the Grand Trunk, in a northeasterly direction to Bangor, and the former keeping to the west of the Central and near the coast to Brunswick and thence up the Kennebec to Skowhegan, 100 miles from Portland, and crossing the Central by its line 84 and by the Central 86 miles from Portland. For this distance the two roads are near together, at the farthest not more than 15 miles. It is intended to make the Portland & Kennebec the trunk line to Kendall Mills. The gauge of the Maine Central will be reduced from 5 ft. 6 in. to 4 ft. 8½ in., to conform to that of the other, and it is said that the gauge of the European & North American Railroad, both in Maine and New Brunswick will also be changed, so as to make a line with uniform gauge from St. Johns to Boston and the West. It is understood that authority will be asked of the next Legislature for the consolidation of the Maine Central, the Portland & Kennebec and the European & North American, which will then form the great line of the East.

Rockford, Rock Island & St. Louis.

In the late election the leading question in Warren county, Ill., was the payment or repudiation of the bonds issued to the above company, and a ticket of officers pledged to repudiation and headed by Hon. A. C. Harding was run. It was defeated, however. The opposition is grounded on an assumed illegality in voting the bonds.

The last rail on the main line was laid last Saturday morning, and a train ran through the same day from Sterling to East St. Louis.

Baraboo Air Line.

A Baraboo correspondent of the Madison *State Journal*, writing on the 7th inst., says: "In twenty-five days, it is said, the grading will be finished from here to the river, about thirty miles, except at Devil's Lake and the Gap. The entire contract is let to Reedsburg, Sauk county, a distance of fifty-five miles. A Minnesota man has taken the sub-letting of the three miles from the Wisconsin west toward Baraboo, and is on hand with teams and hands and promises to do it in twenty working days. A large supply of steel picks, wedges, gun-powder, &c., has crossed the Wisconsin for the Devil's Lake region; shanties and boarding-houses are under rapid construction between the river and Baraboo, and some outsider has contracted to build a boarding-house and maintain supplies for eighty-five men for eight months at Devil's Lake Gap."

Keokuk, Iowa City & Minnesota.

On this road, late the "Iowa Northern Central," it is expected the grading will be finished from Keokuk to Iowa City this fall, and the ties and iron delivered during the winter, ready to proceed with the work in the spring. Frank Dooley has the contract for completing the grading between Iowa City and Washington. Another force is on a short piece of work between Washington and Mt. Pleasant—near Crawfordsville—which also will be finished this fall. When these jobs are completed the grading will be done from Iowa City to Mt. Pleasant. The work between the latter point and Keokuk is well along.

Ottumwa & St. Paul.

The survey of this proposed road was completed to Independence, Iowa on the 14th inst.

Tennessee Railroads.

At the time stated (on the 3d inst.), the Commissioners and officers of the State, appointed by the General Assembly to sell the State's interest in the fourteen delinquent railroads, met at the capitol and proceeded to offer for sale said interest. There being no bidders, there was no sale. This was owing, principally, to the

large amount these roads are indebted to the State. We understand that the Commissioners will memorialize the Legislature to take further action in the matter, and until then there will be no other steps taken to dispose of said interests.

Before the sale was announced Mr. Pennebaker read a notice stating that only the State's interest in the roads would be sold, and that the purchasers would be liable for all future claims that might arise. All the Commissioners were present with the exception of Judge Archibald Wright. After it was ascertained that no sale could be made the Commissioners adjourned until the 6th of December next, when they will submit their report to the General Assembly.—*Nashville Union.*

Philadelphia & Reading.

The Philadelphia & Reading Railroad Company have agreed upon terms for the purchase or perpetual leasing of the Philadelphia, Germantown & Norristown Railroad and its equipments. The conditions are, the increase of the capital stock of the Norristown 35 per cent., and the guarantee of 12 per cent. annual dividends on the entire capital as increased. The capital of the Norristown company, by its last annual report was \$1,595,750, including amount of loan converted. This sum increased by 35 per cent. will swell the capital to \$2,151,292, and 12 per cent. on which will be \$258,511. The total amount of funded debt as shown by the last report was \$55,900. The road, including the Germantown branch, is 20 miles long, besides a branch from Conshohocken of some 6 miles, made within the current year. The equipment of the road is some twenty-five locomotives and 210 or 215 cars of all kinds. It has real estate at \$540,000. One of the reasons advanced for this purchase or permanent lease is that it will give the Reading Railroad more room at its city end and free admission at all times to the heart of the city at Ninth and Green streets, the Norristown Railroad Company owning its road-bed in fee. The arrangement has been consummated, and while it increases the income of the Norristown road, it is also considered a good thing for the Reading.—*Financial Chronicle.*

Leavenworth, Lawrence & Galveston.

This company is about to bring its lands into the market. It will sell on ten years' time and require no advance payment.

The amount of county bonds voted to this road between Lawrence and the Indian Territory is \$1,025,000.

Decatur, Sullivan & Mattoon.

A letter from Mr. J. B. Ayer, Superintendent of the company, is published, announcing that the contracts for building the road have been assigned to Messrs. J. Edwin Conant & Co., of New York.

Peoria, Pekin & Jacksonville.

Two passenger trains now run daily between Peoria and St. Louis, using the track of the Chicago & Alton Railroad south of Jacksonville. One of these is a night train and has Pullman sleeping cars attached. The company is now working harmoniously with both the Chicago & Alton and the Chicago, Rock Island & Pacific companies, connecting with the trains of the latter at Peoria. Some new roads on its line are sure to add materially to its business, one now completed from Pekin to the eastward to Delevan, on the Illinois Farmer's, extending southeastward from Jacksonville and to be extended further in the same direction and also directly southward. The growth of the numerous towns on the line of this railroad, and the heavy demand for agricultural products for manufacturing purposes at some of them, as well as the ordinary merchandise stock and produce traffic, which is so large in the very rich country through which this road extends, promise it a prosperous future.

Duxbury & Cohasset.

Bids for the grading, masonry and bridging of this new Massachusetts road extending from Cohasset, on the South Shore Railroad, southward about 18 miles to Duxbury, were opened on the 15th inst.

St. Louis & Southeastern.

The track on the Shawneetown Division was laid to Equality, on Saturday evening. The remainder of the iron for this division is on the way from New Orleans.

Northern Pacific.

The Minneapolis (Minn.) *Tribune* of the 12th says: "Track-laying on the Northern Pacific Railroad is still progressing west of the Junction, and will continue as fast as possible all winter. Twenty-five miles are now laid. Grading, of course, progresses uninterruptedly beyond the end of the track, and from the Mississippi River west on the Western Division. There are about 3,000 men employed along the line, and the force is increasing every day. Sixty miles have been graded west from the Junction. At the close of this month, one hundred miles of grading will be finished, and forty miles of track laid. There are parties of engineers at work constantly between the Red River and the Mis-

souri, making surveys, profiles, and locations; and from the Pacific Ocean westward the great work is being mapped and profiled preparatory to construction. The most remarkable feature of the work on the Northern Pacific Railroad will be that it will not cease all winter. The contract calls for the completion of the road by July 1, and there is little doubt, judging from the rapidity of construction thus far, that the road will be finished within the contract time."

Atlantic & Pacific.

The South Pacific Railroad, proper, extended to Springfield; from there on to the Pacific the organization was known as the "Atlantic & Pacific," with the same directors and officers. The two companies have now been consolidated, and will hereafter be known and operated as "Atlantic & Pacific Railroad." Andrew Pierce, Jr., is Managing Director; E. F. Perkins, Superintendent; W. H. Patriarche, General Freight and Ticket Agent; Amos Tuck, Land Commissioner; Francis B. Hayes, (Boston,) President.

The road was to be completed to Neosho, the county seat of Newton county, which is about 15 miles east of the Indian Territory, by this time. A survey will be made for a branch from this point to Baxter Springs, near the southeast corner of Kansas, the present southern terminus of the Missouri River, Fort Scott & Gulf road. Such a branch would be about 20 miles long, and would enable the Kansas Pacific to obtain a considerable share of the business of southern Kansas, as it would offer the shortest route to the east and to Chicago.

Portsmouth, Great Falls & Conway.

The contract for building the extension of this road, from Union Village northward to West Ossipee, a distance of twenty-eight miles, has been awarded to Mr. Geo. F. Hitchings, of Portland. Work upon it is to be begun as soon as possible. This road has been leased to the Eastern Railroad Company.

Portland & Kennebec.

The equity case, the Kennebec & Portland Railroad Company vs. the Portland & Kennebec Railroad Company, on trial in Augusta, Me., has been decided in favor of the defendants, dismissing the bill, and thus affirming the right of the new company to the road.

Iowa Midland.

The track on this road is now laid as far as Charlotte, 23 miles from Clinton, and the line will soon be completed to Maquoketa.

National Railway.

This company advertises for bids for the construction of its road from Philadelphia to Yardville, which is on the Pennsylvania side of the Delaware, about six miles above Trenton, and also the Millstone & Trenton and other railroads in New Jersey, which will complete a line from Philadelphia to Jersey City. These proposals will be received at the office of the engineer, J. B. Culver, No. 23 Montgomery street, Jersey City, up to the 25th inst.

Lehigh Valley.

The Philadelphia *Ledger* says that the Lehigh Valley Railroad Company have just consummated an important arrangement with the Erie Railway Company by the laying of a third rail on both tracks of the latter road, which is of broad gauge, from Waverly, which is the present terminus of the Lehigh Valley road, north, to Elmira, a distance of about eighteen miles. The laying of the third rail is completed, and the Lehigh Co. will in future ticket passengers and deliver freight through to Elmira instead of Waverly as hitherto.

Madison & Portage.

The grading of this road was commenced last spring and was prosecuted through the summer. Very little was heard about it, however. On the 1st October tracklaying was commenced at Portage. This work was prosecuted very quietly, but with such energy that trains will be able to run through between Madison and Portage by the middle of December, much to the surprise of the people of these towns even, who, however sanguine, hardly hoped to see the line completed so early. The road is about 35 miles long and has a fine country on each side.

Western & Atlantic.

This railroad, extending from Atlanta, Ga., north by west 138 miles to Chattanooga, Tenn., is the property of the State of Georgia and has been operated by it hitherto. But the Legislature of that State has passed an act authorizing the Governor to lease the road for twenty years for a monthly rental of not less than \$25,000, to not less than seven lessees, worth together not less than \$500,000, a majority in the number and in the interest to be residents of Georgia. These lessees must give bonds to secure the payment of the rental, for \$8,000,000, of which security \$5,000,000 must be in Georgia, and the remainder, if out of the State, must be real estate or railroad property.

No railroad or express company or combination of them may become the lessees. The rates for local freights are limited to the average rates charged on the Macon & Western, the Georgia Railroad and the Central Railroad of Georgia. No discrimination can be made in favor of any other railroad or any person.

This property is said to be worth about \$5,000,000. For the last year reported the gross earnings were \$1,138,300 and the operating expenses 58.58 per cent., or \$688,180, leaving as net earnings \$450,120; but \$134,000 of this were expended for improvements. It is the main line of connection between Georgia and the Northwest.

ELECTIONS AND APPOINTMENTS.

—At a meeting of the directors of the Canada Central Railway, held in Montreal on the 3d instant, Mr. Richardson resigned, through ill-health, the Presidency of the company. The Hon. J. J. C. Abbott was unanimously elected President in his stead, and Mr. L. J. Beaubien Vice-President.

—The stockholders of the Buffalo & Springville Railroad Company met at Springville, Erie county, N. Y., on the 5th instant, and elected as directors: George A. Moore, Stephen Bettinger, Buffalo; John Anthony, John A. Bury, Boston; Abram Thorn, Hamburg; Stephen Churchill, Colden; W. G. Ransom, Ashford; Salmon Shaw, Charles Shuttleworth, J. N. Richmond, Bertrand Chaffee, H. G. Leland, Springville; L. C. P. Vaughan, Concord. Subsequently the following officers were chosen: Salmon Shaw, President; J. N. Richmond, Vice-President; Morgan L. Badgley, Treasurer; C. C. Severance, Secretary.

—The St. Louis, Council Bluffs & Omaha Railroad Company (successor, by consolidation, of the Chillicothe & Brunswick, Chillicothe & Omaha, and the St. Louis & Council Bluffs companies,) at their recent election, elected as directors: J. H. Britton, James B. Eads, John G. Copelin, and Wm. Taussig, of St. Louis; J. H. Hammond, of Chillicothe, Mo.; Edward Creighton, of Omaha, Vice-President of Western Union Telegraph Company; Gen. G. M. Dodge, Council Bluffs, late Chief Engineer Union Pacific Railroad; Wm. T. Gliddon, Boston, Mass.; Pierre le Pont Morgan, New York; Hon. P. Bear, Gallatin, Mo.; C. G. Comstock, Albany, Mo. The following officers were elected for the ensuing year: President, J. H. Hammond; Vice-President, G. M. Dodge; Treasurer, Wm. Taussig; Secretary, James Howe.

—At a recent meeting of the stockholders of the Madison Railroad Company, at Rutland, the following directors were chosen: John B. Page, George A. Merrill, Rutland; Peter Butler, Boston; Gasca Rich, Shoreham; A. B. Waldo, Port Henry, N. Y. On motion, it was voted that the proper officers of the road be authorized to make and execute a lease of the road, etc., to the Rutland Railroad Company. The directors were instructed to proceed at once, and make all necessary contracts, so as to insure the completion of the railroad during the coming year.

—Mr. E. Q. Sewall, has resigned the superintendency of the Delaware Railroad and accepted a position as General Superintendent of the New Orleans, Jackson & Great Northern Railroad.

—At a meeting of the National Land Company, held in St. Louis on the 10th inst., the following officers were elected: John S. Loomis, New York, President; Chas. B. Lamborn, St. Louis, Secretary and Treasurer; C. N. Scott, Chicago, General Agent; Wm. E. Webb, General Manager, District of Kansas; Wm. N. Byers, General Manager, District of Colorado.

—Mr. George C. Morton, late General Freight Agent of the Burlington & Missouri River Railroad, has been appointed General Ticket Agent of the St. Louis & Southeastern Railway.

—John Parks, formerly station agent of the New York Central, at Medina, during the war a superintendent of United States military railroads in the Southwest, and latterly in the service of the Erie Railway, has been appointed Superintendent of the new Suspension Bridge & Erie Junction road. Notwithstanding the fact that Mr. Parks was once a member of the New York Legislature, he is said to be a very capable and honorable man.

—Mr. C. W. Mead, Assistant General Superintendent of the Union Pacific Railroad, has resigned. Mr. Mead was one of the appointees of Col. Hammond. He was formerly General Superintendent of the Hannibal & St. Joseph Railroad, received his railroad education on the Chicago, Burlington & Quincy Railroad under Col. Hammond's superintendency, and is esteemed as one of the ablest railroad managers in the West, as he is certainly one of the most popular.

Scarcely any other man on the Union Pacific has been so well liked and so much respected as Mr. Mead.

—Mr. J. N. Conger, who has heretofore acted as General Freight Agent of the Rock Island Division of the Rockford, Rock Island & St. Louis Railroad, has been made General Freight and Ticket Agent of the entire line. Capt. E. A. Sheble, who has been for some months General Freight Agent of the St. Louis Division, and who was formerly manager of the Peoria & St. Louis Packet line, has established a commission house in company with his son, who has been a ticket agent of the same road.

—Mr. A. E. Little, who was General Ticket Agent of the Chicago & Milwaukee Railroad before the consolidation, and has since been Paymaster of the Chicago & Northwestern and more lately in business in New York has been appointed General Passenger Agent of the Rockford, Rock Island & St. Louis Railroad.

—Robert Garrett of Baltimore has been elected President of the Virginia Valley Railroad Company in place of Gen. Robert E. Lee, deceased.

—Emmons Raymond, of Boston, has been chosen President of the Connecticut & Passumpsic Rivers Railroad in place of Hon. Henry Keyes, deceased.

—Mr. Greenlaw, who recently took the contract for the completion of the Memphis & Little Rock Railroad, has appointed J. B. Beaumont General Manager, with instructions to finish the road by February 10.

—Mr. E. Sweet, Jr., has been appointed General Superintendent of the Rockford, Rock Island & St. Louis Railroad. Mr. Sweet is from New York. In October, 1869, he was appointed Chief Engineer of the company and since that time has had charge of the construction of its road. He now has charge both of the engineering and superintendent's departments.

—Addison Day, who was for some years General Superintendent of the Rome, Watertown & Ogdensburg Railroad and for more than a year has held a similar position on the New York & Oswego Midland Railroad, has been appointed General Superintendent of the St. Louis & Iron Mountain Railroad in place of J. H. Morley, who has heretofore been Chief Engineer and General Superintendent.

—W. R. Arthur, during the war and for a year afterwards General Superintendent of Illinois Central Railroad, has been appointed General Superintendent of the North Missouri Railroad in place of S. H. Knight, resigned. Mr. Arthur is a man of very rare executive ability, and he will find full scope for all his powers on the great and growing system of lines which now passes under his management.

TRAFFIC AND EARNINGS.

—The receipts of the Great Western Railway of Canada, for the week ending, October 21, 1870, were:

Passengers.....	\$34,076 76
Freight and Live Stock.....	52,746 89
Mails and Sundries.....	1,750 12
Total receipts for week.....	\$88,573 78
Corresponding week, 1869.....	90,060 15

Decrease (1½ per cent.)..... \$1,506 87

—Shipments are made from St. Paul to New York by the Lake Superior & Mississippi Railroad and lake from Duluth to Buffalo in ten or twelve days, which, it is claimed, is four days less than by way of Chicago or Milwaukee.

—Baxter Springs has already become a great cattle shipping point. In one week in October 208 car-loads were shipped from that place, and 33,000 head were in the vicinity, and to be shipped.

—Mr. S. T. Smith, Auditor of the Kansas Pacific Railway Company, makes the following estimate of earnings of the company for the fourth week in September:

From freight:	
Ordinary.....	\$46,000 00
Government.....	200 00
Total.....	\$46,200 00
From passengers:	
First-class.....	\$24,300 00
U. S. troops.....	990 00
U. S. mails.....	1,397 92
Total.....	\$26,687 92
Total estimate.....	\$72,887 92

—The Fairbanks Scale Company recently paid a bill of \$12,000 for freight to the Connecticut & Passumpsic Rivers Railroad.

—It is announced that the Ohio & Mississippi Railroad has completed arrangements with the Carroll line of steamers from St. Louis, to transfer freight from this city to all points South. The rates announced from Cincinnati to Vicksburg and New Orleans are, bacon, 50 cents per hundred pounds; pork, \$1.50 per barrel; way landings, 5 per cent. advance.

OLD AND NEW ROADS.

Continued from Page 176.

Chicago, Southwestern & Nebraska.

This is the title under which a company has been incorporated in Iowa to construct a branch of the Chicago & Southwestern Railway nearly due west through the southern tier of counties of the State to the Missouri River opposite Nebraska City. The distance is about 130 miles by an air line, and the route is parallel with and from 12 to 24 miles distant from that of the Burlington & Missouri River, and pretty much the same as that on which the Burlington & Southwestern proposes to build.

Pekin, Lincoln & Decatur.

This road, twelve miles of which, from Pekin to Delavan, is in operation, and a large part of the rest graded, has been consolidated with the Toledo, Wabash & Western Railway. The entire road will extend from Decatur northwest to Pekin, a distance of about 60 miles, through a very fertile country a fair share of whose traffic it is likely to obtain.

New York & Philadelphia.

At a meeting of the directors of the National Railway Company, held at their office in Philadelphia on the 5th instant, it was unanimously resolved to invite proposals, up to the 25th instant, to build several connecting roads, in whole or in sections, between Philadelphia and New York. The length of the connected lines is 86 miles, and the whole is to be laid with steel rails. The work is to be begun at once, and prosecuted vigorously.

New York to St. Louis.

Pullman and Wagner sleeping coaches commenced running through between New York and St. Louis, via the New York Central & Hudson River, Lake Shore & Michigan Southern and Toledo, Wabash & Western roads on the 7th instant. A through car is attached to the Pacific express leaving New York at 8 p. m. daily. This is advertised as the "Great Wabash Route." There are now three through lines between New York and St. Louis, two of which run over the New York Central and Lake Shore & Michigan Southern between New York and Cleveland. The one running over the Cleveland, Columbus, Cincinnati & Indianapolis and the Indianapolis & St. Louis roads from Cleveland to St. Louis is called the "Bee Line." The third is the short line by Vandalia, Terre Haute, Indianapolis, Columbus, Pittsburgh and Philadelphia, all the sections which the Pennsylvania Railroad Company controls.

Madisonville & Shawneetown.

This road, which is the Kentucky extension of the St. Louis & Southeastern road, is proposed to run from Shawneetown, Ill., southeast about 45 miles, to Madisonville, Kentucky. The following amounts have been voted by points on the line: Madisonville, \$25,000; Nebo, \$15,000; Providence, \$30,000; Lindle, \$15,000; and Caseyville, \$60,000, making \$145,000. If Clayville votes favorably on the 26th instant for a \$30,000 subscription, this amount will be swelled to \$175,000. This amount, it is estimated by competent engineers, will be sufficient to grade and bridge the road almost the entire distance between Madisonville and Shawneetown.

Winona & St. Peter.

Mr. Ward, Chief Engineer of the company, has received orders to proceed at once with the survey from St. Peter to New Ulm.

Pembina & Sioux City.

Ground was broken at the Sioux City end of this road on the 4th instant. A large force of men are engaged in grading and a considerable quantity of iron and ties is at hand.

Union Pacific.

A reduction of eight dollars from Chicago and St. Louis, and of five dollars from Omaha, has been made in the second-class fare to points in California. This is done to encourage immigration. The rates now are: From Chicago and St. Louis to San Francisco, Sacramento and Marysville, \$85.00; to Colfax, \$84.00; to Reno, \$83.00; Battle Mountain, \$80.00, and Elko, \$79.00. From Omaha to San Francisco, Sacramento and Marysville, \$75.00; Colfax, \$73.00; Reno, \$70.00; Battle Mountain, \$67.00; Elko, \$66.00—a reduction of \$5.00. The rate from New York to San Francisco is \$100. Second-class cars now run on the regular passenger trains.

Petaluma to Santa Rosa.

Sixteen miles of this California road has lately been completed from Petaluma to Santa Rosa, the county seat of Sonoma county, and trains will be running very soon.

Chicago & Southwestern.

In Topeka, Kansas, on the 8th inst., the proposition to subscribe \$150,000 stock to the road was carried by about 1,000 majority.

REGISTER OF EARNINGS.

FOR THE MONTH OF OCTOBER.

Des Moines Valley (344 miles), 1870.....	\$88,151 00
" (169 miles), 1869.....	71,047 00
Increase (34 per cent.).....	\$17,104 00
Pacific of Missouri (355 miles), 1870.....	\$341,373 00
" (355 miles), 1869.....	329,243 00
Increase (3½ per cent.).....	\$12,130 00
St. Louis & Iron Mountain (310 miles), 1870.....	\$127,069 10
" (310 miles), 1869.....	93,871 11
Increase (35½ per cent.).....	\$33,197 99
Cleveland & Pittsburgh (303 miles), 1870.....	\$186,895 65
" (303 miles), 1869.....	165,996 57
Increase (13 per cent.).....	\$20,899 08

FOR THE FIRST WEEK IN NOVEMBER.

Chicago & Alton (465 miles), 1870.....	\$99,042 07
" (431 miles), 1869.....	97,053 14
Increase (3 per cent.).....	\$1,988 93

PERSONAL.

—The British Institution of Civil Engineers has awarded a Watt medal and a Telford premium, in books, to Robert Briggs, of Philadelphia, for his paper "On the Conditions and Limits which Govern the Proportions of Rotary Fans."

—The Leavenworth *Call* speaks as follows of Mr. J. S. Lazarus, General Western Passenger Agent of the Toledo, Wabash & Western Railway at Leavenworth: "Mr. L. has been long and favorably known by our citizens as a gentleman of integrity, courteous and affable in his manners, and ever alive to the interests of the corporation he represents. Commencing, as he did, at the lowest round of the ladder, he has steadily advanced, meriting at all times the highest appreciation of the company."

—Mrs. Collins, of Haddam, N. H., is said to be pushing her contract on the Valley road, just below Haddam, with great energy. She superintends the work and pays off her men with her own hands.

—Oliver L. Towle, a conductor on the Portland, Saco & Portsmouth Railroad, has been on that road thirty years and traveled on it nearly a million miles.

MISCELLANEOUS.

—A correspondent of the *Journal of the Telegraph* enumerates as follows the blushing honors that have fallen thick upon him—thick enough, one might think, to quite smother him:

"I am railroad agent, ticket agent, station baggage man, clerk for railway, porter for railway, agent for United States Express, money clerk and porter; manager for Western Union Telegraph Company, day operator, night operator, receiving clerk, forwarding clerk, error clerk, message boy and porter. If there is a man that fills more offices than that in the employ of the Western Union Telegraph Company, I would like to see him and shake hands with him."

—Mr. J. D. Reid, who receives contributions for a statue in honor of Prof. S. T. B. Morse, the inventor of telegraphing, gives the following account of the receipts up to the 1st inst.:

Cash receipts from all quarters.....	\$6,247 85
Losses by mail, but credited.....	\$10 00
Sundry expenses, postage, etc.....	2 30
	12 30

Balance.....	\$6,235 55
Cost of Statue.....	6,060 00

Balance applicable to the provision of base..... \$235 55
Several thousand dollars more is required, but there is every indication that the amount will be raised without difficulty.

—During the four days ending last Monday the following shipments of cattle (chiefly Texas cattle) were made from Kansas City: Hannibal & St. Joseph, 27 cars; Missouri Pacific, 61; North Missouri, 54. On the 2d inst. 86 car-loads were shipped—35 by the Hannibal & St. Joseph, 20 by the Missouri Pacific, and 31 by the North Missouri.

—The last statement of the United States public debt has the following railroad account:

Bonds issued to the Pacific railroad companies, interest 6 per cent. payable in lawful money:

	Amount outstanding.	Accrued interest, not yet paid.
Union Pacific.....	\$27,236,512	\$544,730 24
Kansas Pacific, late Union Pacific, Eastern division.....	6,303,000	126,060 00
Sioux City & Pacific.....	1,628,229	32,566 40
Central Pacific.....	25,881,000	517,620 00
Central Branch Union Pacific—assignees of Atchison & Pike's Peak.....	1,600,000	32,000 00
Western Pacific.....	1,970,000	39,400 00

Totals.....	\$64,618,839	\$1,292,376 64
Interest paid by the United States.....		\$8,815,345 49
Interest repaid by transportation of mails, etc.....		2,412,683 12
Balance of interest paid by United States.....		6,402,669 37

—For the week ending November 16, the following shipments of cattle were made from Kansas City: by the Pacific of Missouri, 151 cars; North Missouri, 135; Hannibal & St. Joseph, 96.



PUBLISHED EVERY SATURDAY.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, if not previously published, FREE OF CHARGE. They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Engineering and Mechanics.—Mr. M. N. Forney, Mechanical Engineer, whose office is at Room 7, No. 72 Broadway, New York, has been engaged as Associate Editor of this journal in charge of these departments. He is also authorized to act as our agent.

Change in Rates.—On and after the 1st of January next, the price of subscription will be four dollars per year. Until that time, subscriptions will be received for periods not exceeding one year at the old rate—three dollars per year.

Our Prospectus and Business Notices will be found on the last page.

SOME OF THE DIFFICULTIES OF MAKING A GOOD RAILROAD PAPER.

If inexperienced persons had a better knowledge of the amount of time, labor and skill required to make a good weekly journal, we should probably not so often hear the question asked, "why have we not in this country technical papers corresponding to those published in Europe?"

Take, for example, the London *Engineer*, of which we have a copy before us. It has sixteen pages which are somewhat larger than those of the RAILROAD GAZETTE, filled with reading matter. It has one full page illustration, and three other pages nearly filled with wood cuts. The matter is in much more condensed type than in the paper you are reading, and is nearly all either contributed or editorial, excepting the "patent journal," which fills about two pages. The cuts for the number before us would cost in this country about two hundred dollars. It is printed on fine, heavy paper, with admirable press work. The contributions in it are of a kind which we find extremely difficult to procure here, and are written by persons who obviously not only have professional knowledge but are trained and cultivated writers besides. If any of our readers are disposed to be captious or feel inclined to compare the RAILROAD GAZETTE with the other

paper under consideration, we must remind them that the cost of *The Engineer* to American subscribers, is fifteen dollars per year, while that of the GAZETTE is now only one fifth that sum.

Besides, *The Engineer* has sixteen pages of advertising, the rates for which, we think, would amaze our patrons. The proprietors are therefore able from their receipts to expend much more on their paper than is practicable on any comparatively new project of a similar character in this country, and much more than is expended on any technical journal in America, new or old.

It must also be remembered, that a paper published in London has the whole railroad world for a market. *The Engineer* has, or rather had, an agent in Paris, has one in Berlin, Vienna, Leipsic, St. Petersburg, Madrid and New York. In Europe there are a much larger number of liberally educated engineers than here—men who are either wealthy or in receipt of comparatively large incomes—to whom the cost of subscription is not an objection. Engineers of a similar character and position all over the world may be, and to a very great extent are patrons of the papers to which we have referred. In this country that class alone is not large enough to furnish sufficient patronage to a publication like *The Engineer*. There are, however, a much larger number of reading men among working mechanics and operatives here than there, probably because every man here has an opportunity of rising to a higher position. It is from this class that a railroad paper receives a large patronage, and to whom much of its space should be adapted. The matter which it contains should, as far as possible, be of a practical character,—something which will aid the men in the performance of their duties, or be of assistance in qualifying them for higher positions.

To fill a paper which gives from twelve to thirteen pages of reading matter each week with material of the kind we have described is no easy task. It is manifestly impossible for an editor, no matter how well his mind may be stored with information, his memory with facts, or his imagination with theories, to draw upon this store continuously. If he is human his supply will run out, and then he must draw from other sources. It is in doing this, that an editor finds his chief difficulty. He knows that all about him there are thousands of facts and figures, ideas and inventions, if he could only avail himself of them. The persons who are in the possession of such information are usually unwilling to communicate it, but either from indifference or because they do not realize how much what they have at their fingers' ends would interest others, do not contribute any of it to the general supply. We are of course aware that persons who acquire valuable knowledge are usually a hard working class, with little leisure for any but their necessary work. Nevertheless, a little thoughtfulness would often contribute information which through the GAZETTE would be distributed to many interested readers. It would not require much time to enclose us a copy, when reports or notices or other matter is sent out by mail. A few scratches of a pen will often communicate an important fact of which we and our readers would otherwise be ignorant. A word to a clerk would frequently furnish us with a valuable document containing perhaps the results of experiments or facts and figures which are entirely out of our reach. A hint to a draftsman or a little sympathy on his part with the RAILROAD GAZETTE and the public, would often supply us with copies of drawings which otherwise we could not get.

Take for example the weight of rolling stock. We find the most inaccurate ideas prevail in reference to what locomotives, tenders, ordinary passenger and sleeping cars, covered freight, platform and coal cars weigh. We cannot think at the present time of any information which would be more useful than a list of the weights of different kinds of cars and engines, with their dimensions, carrying capacity, etc. We do not mean their "estimated" weight—any one can guess at such things—but we mean their weight taken down at the side of an accurate scale, at the time the car or engine is weighed. If any of our readers have such data we trust they will act upon our suggestion and communicate them. A short time ago we wanted to find the weight of an ordinary freight car truck, but found it impossible to get reliable figures without going to some of our railroad friends with a special request to have one weighed. This would have involved more trouble and time than we felt justified in giving it then, and therefore we were obliged to let what otherwise would have been a sharp argument go blunted, because we had not the necessary fact with which to point it.

We are of course not referring exclusively to the special class of facts we have named, as more desirable for a railroad paper than anything else, but merely citing them as a case in point. A letter to a paper, either for publication or merely to communicate infor-

mation, is always welcome. Here the European papers again have the advantage. Many of the engineers there have not only the requisite professional knowledge, but also the early training and practice which enables them to write with ease. There is therefore not nearly so much difficulty in getting good contributions there as there is here. It is not that the necessary knowledge can not be found here, but self-made men who have not had many advantages of early education, nearly always exaggerate that fact into an insurmountable obstacle in the way of their writing anything for publication. Many people have come to regard good writing as the result of a sort of "trick of grammar," and think that without it nothing that is worth reading can be written, and if it is only once learned, it will always serve to convert nonsense into wisdom and enable any fool to write good sense. The first and most important requisite in writing anything for publication, is to have something to say which is worth knowing. No amount of rhetoric or good grammar will atone for poverty of ideas, but valuable knowledge will cover almost any errors of composition. The reason why the productions of inexperienced writers are not valuable for publication is not so much that they cannot express what they do know, but that they try to write what they do not know. It is not what people think, usually, which is most valuable; it is what they see. Nearly any intelligent foreman, locomotive runner, engineer, freight or ticket agent, or person holding any position of responsibility or doing any useful work, could contribute interesting and valuable information to a paper, if they were only to observe carefully the things which come under their daily observation, and then report what they see. The difficulty is, so few people can discriminate between the facts which they see and their own feelings or inferences. In spite of themselves their report will be colored by their own prejudices, fancies, or digestion, if you choose.

Another trouble is that people who are not accustomed to communicate their ideas to others by writing omit many of the important details. Things which seem so familiar to them they do not think can be important to others. The successive steps in a process they do not explain, and consequently the reader finds wide gaps in his understanding of it. As we intimated before, almost any good mechanic employed about a railroad who should write out a detailed account of the process of his trade, show the successive steps of his work, explain wherein the difference between good work and poor work consists, and tell what material to use and how that which is good can be distinguished from the bad, would be contributing information which would be valuable not only to the members of his own trade, but also to the managers of railroads. Take machinists, boiler-makers, blacksmiths, moulders, pattern-makers, car and bridge builders, carpenters, painters, upholsterers of cars, track layers, etc., and any one of them, if he understands his business thoroughly, knows a great deal more in that special direction than others do.

It is with the other departments of railroad operations much as it is with railroad mechanics and engineering, with exception that in the department of transportation railroad men not only are unaccustomed and generally disinclined to write, but have hardly any examples before them, for the literature of this department for the most part remains to be written. We have made a beginning in this direction, and we know that contributions we have published on accounts, advertising, systems of working, etc., have attracted very general attention and approval. But we are quite aware that we have only made a beginning, and although that has been satisfactory as a beginning, there is still abundant room for further improvement. All rational improvements and reforms in transportation must be made by those who are engaged in that business, and discussions of systems and modes of working, of machinery and works, must come from the pens—or the tongues—of those who are engaged and are familiar with them.

We hope that many of our readers will act upon our suggestions. If they should all contribute of their store, we should be able to furnish a feast each week the materials for which are now almost entirely out of our reach. Write us a letter in your leisure moments. If a new locomotive or new cars are being built, or a new road in process of construction, write and tell us of it. The facts are what we need most. The grammar, the punctuation and the spelling are of not much consequence to us. Our proof reader will correct all errors of that kind. If there has been a change of officers advise us of it. If a locomotive has exploded tell us all about it, and especially the cause, if known. For such favors the GAZETTE will try to reciprocate a hundredfold. Remember that its editors have not the power of being ubiquitous, and that in order to make the paper what you, and they would like it to be, your co-operation is indispensable.

SOME LEGITIMATE ADVERTISING.

We have before us a poster designed by Mr. A. M. Smith, General Passenger Agent of the Chicago, Rock Island & Pacific Railroad, and published by that company as an advertisement. This poster has printed upon it in colors a fine lithographic map of the northern hemisphere, 15½ inches in diameter. This shows that part of the world between the Equator and the North Pole, including all of North America, Europe, Asia, the greater part of Africa, and the northern part of South America. It is entitled, "Map of the Great 'International Railway and Steamer Routes Around the 'World.'" North America appears at the bottom of the sheet. Beginning at Chicago, the route westward to the Pacific by the Rock Island and the Pacific roads is shown by a red line, to San Francisco. This line is continued across the Pacific to Yokohama, Japan, and Hong Kong, China, to indicate the route of the Pacific Mail steamship line. Thence it keeps along the Chinese and Siamese coast southwestward, doubling Cape Roman, the extreme southern point of Asia, very near the Equator, and thence near the eastern shore of Bay of Bengal northwestward to Calcutta, which is the route of a line of the Peninsular & Oriental Company's steamers. From Calcutta the red line extends across the great Indian peninsula to Bombay on the Arabian Sea, indicating the railroad line across India. There another Peninsular and Oriental line extends across that sea and up the Red Sea to Suez, whence the route to the Mediterranean is either by the Alexandria & Suez Railroad or the Suez Canal, and, again by the Peninsular & Oriental line or the French "Messageries Impériales" (now more appropriately *Messageries Republiques*) to Marseilles or Havre or London. Across the Atlantic the route is that of any Atlantic steamer line. To Chicago the different lines from Portland, Boston, New York, Philadelphia and Norfolk are shown.

Thus the map shows a complete route around the world by railroad and steamer lines which afford comfortable and for the most part luxurious accommodations. The route appears on the map as an irregular quadrilateral, the shortest side being that across North America, the longest from San Francisco to Cape Roman, the second in length that from New York to the Straits of Babelmandeb at the mouth of the Red Sea, and the third that from the last named point to Cape Roman, which is opposite the line from New York to San Francisco. The map, however, distorts the positions of places considerably, and the line as it appears on the globe, and as it is on the earth, is more nearly circular.

The distances and times of traveling them are given on the map as follows: Chicago to San Francisco, 2,408 miles, in 5 days and 8 hours; San Francisco to Yokohama, 4,714 miles, in 21 days; Yokohama to Hong Kong, 1,670 miles, in 6 days; Hong Kong to Calcutta, 3,500 miles, in 14 days; Calcutta to Bombay, 1,229 miles, in 2 days; Bombay to Marseilles, 5,500 miles, in 18 days and 5 hours; Marseilles to Havre, 575 miles, in 30 hours; Havre to New York, 3,150 miles, in 9 days; New York to Chicago, 899 miles, in 30 hours. Total distance, about 23,636 miles; time of passage, about 78 days. The poster adds: "The entire trip will cost for 'fare not to exceed \$1,600 (currency), and with little 'additional expense one can visit, while *en route*, many 'of the principal cities of Japan, China, India, Egypt, 'Italy, Spain, France and England. Leaving the 'States in the months of September or October enables 'the traveler to pass through the low latitudes during 'the winter months."

We have called attention to this not only because of its inherent interest, as showing at a glance the completeness of modern routes of transportation in all quarters of the northern hemisphere, but because it is a striking example of honest, ingenious and efficient advertising. It catches the eye at once. Maps are not so strange as to excite remark or even a passing notice, but a map of a hemisphere is something new as an advertisement. The most casual observer is arrested by it and is pretty sure to examine it with some care, to be interested by it, and very likely to study it. Certainly it is well worth studying. The ingenuity of the design and the excellence of its execution are exceedingly creditable to Mr. Smith.

Another specimen of ingenious and useful advertising which we have seen lately is a map of the route between Chicago and San Francisco by way of the Burlington & Omaha line and the Pacific roads and was prepared and issued by Mr. A. E. Touzalin, the General Ticket Agent of the Burlington & Missouri River Railroad. We have no copy of it at hand at present, but describe it as we remember it. It is a map on a large scale, altogether, we believe, about eighteen feet long,

but it is printed in four parallel lines as a poster and in four separate slips folded together for circulation among travelers. This map is not intended to give the general direction, but to represent with some minuteness the location of objects of interest along the line. So we have not only all the stations on the line indicated; but the other towns in the vicinity with their distances from the stations, the stage and other lines connecting them, and such other information as will enable the traveler to understand the country as he passes through it.

Still another example of good advertising comes from Mr. E. St. John, the General Ticket Agent of the Chicago, Rock Island & Pacific Railroad. This is a little salmon-colored circular, folding small enough for the vest pocket, which gives in tabular form the rates of fare to all stations on the Rock Island road and the Union Pacific, to seven principal stations on the Central Pacific, to Denver, to stations on the Colorado Central, and, what it has not been easy to obtain heretofore, to points connected with the Pacific roads by stage lines. Thus it gives the fare by the lines from Reno to Virginia City, Nev., from Corinne, Utah, to Virginia City and Helena, Montana, from Battle Mountain to Austin, Nev., and from Elko to White Pine, Nev. Both first and second-class rates are given. There are also a table of distances from Chicago to the chief points named, forms of coupons and directions to agents selling extension tickets west of Chicago, with thirty-four different forms, addresses of officers of the lines named who can give information concerning connections by their lines to any points not named in the circular, a map of the route from Chicago to San Francisco, and the rates for double berths from Chicago to Peoria, Rock Island, Davenport and Omaha, and on the Union and Central Pacific roads.

The striking feature in all these advertisements is that *they are useful to the traveler*. They give him information of value, and on that account they are received gratefully, examined carefully, preserved, and consulted frequently. They give information truthfully and honestly, and we therefore commend them as examples of *legitimate advertising*.

THE ROCKFORD, ROCK ISLAND & ST. LOUIS.

This road, whose progress we have noted at various times since its beginning, was completed last Saturday to a connection between its St. Louis and Rock Island divisions, making an unbroken line of about two hundred and eighty miles between Sterling, on the Galena Division of the Chicago & Northwestern road, and St. Louis. A large portion of the road has been in operation during the past summer and is in excellent condition, and the newly finished part, between Monmouth and Rock Island, is in such order as to warrant the company in opening for business and running through trains next Monday.

Starting at St. Louis the road runs on the track of the St. Louis, Alton & Terre Haute Company as far as Upper Alton; thence in a direction a little west of north the road crosses the main line of the Chicago & Alton at Brighton, its Jacksonville Division at Whitehall, the Toledo, Wabash & Western at Bethel, the Illinois river at Beardstown, and meets the Chicago, Burlington & Quincy road, main line and branches, at four points: Vermont, Bushnell, Monmouth, and between Galva and New Boston. At Bushnell the Toledo, Peoria & Warsaw road is also crossed. From Orion to Coal Valley the company have laid their iron on the grade of the Peoria & Rock Island Company and will make use of their line as far as Rock Island. Here the Rock Island Division commences and follows the Rock River valley up as far as Sterling—the present terminus. A survey of the extension of the road up the river, through Dixon and Rockford to Beloit, has been made, but its construction will not be commenced before next season, as the company's attention will be devoted to the perfection of the road already in operation. Liberal subscriptions from the points between Sterling and Rockford have been secured.

The company will run through freight and passenger trains between Chicago and St. Louis, having made arrangements for the use of the Northwestern's line from the Wells Street Depot, in this city, to Sterling.

The construction of the road was begun in the summer of 1868 with the intention of connecting Sterling and Rock Island and the intervening coal fields. With the Hon. George Green, of Iowa, as President and Mr. H. H. Boody, of New York, as Treasurer, a contract for the building of this section was made with Messrs. Wm. Irvin & Co. In the winter of 1868-9 the company's charter was so amended as to enable them to extend this small beginning in both directions, to St. Louis, and Beloit, Wisconsin. During the fall of 1869 the company effected a settlement with Wm. Irvin & Co. and closed their contract, and since that time have themselves

attended to the construction. Judge Green has during the past year sold his interest in the company and retired from the presidency. Much of the funds needed for construction has been secured in Germany, and large corporate subscriptions, by the towns and counties through which the road passes, have been made.

The present officers of the company, chosen at the late October election, are James R. Young, President, Chicago; H. H. Boody, Treasurer, New York; J. P. Whitehead, Secretary and Auditor, H. P. Boody, Local Treasurer, and E. Street, Jr., Chief Engineer and General Superintendent, Rock Island; J. N. Conger, General Freight and Ticket Agent, No. 20 North Fourth street, St. Louis.

Licensing Locomotive Engineers.

Mr. Charles Wilson, the chief executive officer of the Brotherhood of Locomotive Engineers, an organization which embraces a very large part of the locomotive engineers employed in the United States and Canada, in an address before a convention of the Brotherhood at Nashville last month opposed the licensing of engineers by law, and gave it as his opinion that a certificate from the Brotherhood would be the best possible evidence of the qualifications of an engineer.

Now we believe this Brotherhood has been a very reputable and useful organization and has gained the respect and often the co-operation of those who are interested in the safe and economical operation of railroads; but we do not believe that a certificate from any body of employees, however respectable, will ever be accepted as satisfactory or sufficient evidence to employers as to the qualifications of members of that body. What is required is that the engineer should satisfy his employer rather than his fellows. If a system of licensing is to be adopted, it will be for the protection of the railroad companies and the public. The companies are able to enforce their views as to the capacity of a man, and the advantage of a license system to them would be to relieve them of some trouble, and this would be the case only if the examination were severe, practical, exhaustive and careful. To the public the State license would be rather a defence against careless companies than careless and unqualified engineers, for it is only the former that will employ the latter. It might, perhaps, be an advantage to the engineer to have a certificate of capacity which would be everywhere recognized as trustworthy, but this must come not from average engineers, as represented in any association, but from the best men among them, such as occupy positions of trust and responsibility in the railroad companies, or such as should be appointed on State boards of examination, should a license system be adopted.

It is entirely true that a license system might be altogether ineffective, and would certainly be only a hindrance and not at all a help to the engineer if it were not managed honestly and ably. Not the slightest weight would be attached to a license if it were granted on insufficient evidence of character or capacity.

Pennsylvania Railroad Dividends.

The Treasurer of the Pennsylvania Railroad Company advertises that on the 1st inst. the Board of Directors declared a semi-annual dividend of 5 per cent. on the capital stock of the company, payable in cash on or after the 30th inst. The following are the dividends declared heretofore according to Poor's Manual: Previous to 1862 the stockholders received an average of 6½ per cent. on their investment. Since 1861 the following cash dividends have been paid (May and November): 1862, 4 and 4 per cent.; 1863, 4 and 5 per cent.; 1864, 5 and 5 per cent.; 1865, 5 and 5 per cent.; 1866, 5 and 4 per cent.; 1867, 3 and 3 per cent.; 1868, 3 and 5 per cent.; 1869, 5 and 5 per cent.; 1870, 5 and 5 per cent. Stock dividends of 30 per cent. in May, 1864, 5 per cent. in May, 1867, and 5 per cent. in May, 1868, have been made. Counting the stock at par at the market price, 120, the average annual return to the stockholders of this company has been 14.2-9 per cent.

—The Internal Revenue Bureau has written to Assessor Dathorp, at Albany, respecting the assessment of the tax upon what is known as the eighty per cent. scrip dividend, declared by the New York Central Railroad Company in favor of the stockholders. The Commissioner says: "Regard for the interests and rights of 'the Government forbid that the assessment should 'longer be delayed.'"

—G. W. Frost, Purchasing Agent of the Union Pacific Railroad Company during the period of construction, brought a suit against the contractors for \$40,000. After trial a verdict was given for \$11,000, which the judge set aside. The case was then settled for \$5,000.

THE ST. LOUIS & SOUTHEASTERN RAILWAY.

St. Louis, November 12, 1870.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A little more than a year ago that part of the State of Illinois south of the Ohio & Mississippi Railroad, a triangular territory with a base 125 miles long on the above railroad, and a height of 120 miles to its apex at Cairo, was more destitute of railroads, probably, than any other section of equal extent, population and wealth north of the Ohio River. The Illinois Central, like a perpendicular let fall from the apex, divided it in two not very unequal sections. Besides this the only road was a line less than 25 miles long, from Carbondale to Grand Tower, constructed for carrying coal for a mining and iron smelting company. St. Louis had access to its western border by the Mississippi River, and its northern by the Ohio & Mississippi Railroad, but for the most part this broad territory, close to our doors, which formerly bought its merchandise and sold its products in our market, was almost inaccessible to St. Louis, while, as we have seen, Chicago penetrated to its heart by the Illinois Central, while Cincinnati, Louisville and Evansville, through the Ohio and the Wabash, maintained profitable connections with the eastern and southern parts.

But within a few short months all this has been changed. St. Louis stretched forth two arms which now reach to the heart of Southern Illinois, and Egypt is her own again. So much at least we claim. Hereafter if we fail to obtain the trade or a fair share of the trade of Southern Illinois, it will not be for want of connections.

One of these new lines, the St. Louis & Southeastern Railway, celebrated the completion of its road to Mount Vernon, the county seat of Jefferson county, Illinois, on Tuesday last. Your correspondent had the honor and the pleasure to be one of that excursion party, and of it and the road whose opening was celebrated he now purposes to write.

To begin with the latter: The St. Louis & Southeastern Railway, if the well matured and well progressed plans of its projectors and managers shall be carried out, as there is every reason to believe they will be, will be rather a system of railroads than a single line, and will be to St. Louis on the Southeast much like what the North Missouri is on the Northwest, or what the Chicago & Northwestern Railway is to Chicago on the Northwest: that is, it will receive the traffic tending towards St. Louis from nearly an entire quadrant, from the Ohio & Mississippi on the north to the Illinois Central and the Mobile & Ohio on the west. The part now completed is the trunk from which branches are to diverge. This trunk line extends in a direction a little south of east to Nashville, the county seat of Washington county, 49 miles from St. Louis, running near the old Belleville Railroad (whose extension to Du Quoin will soon be opened) to Belleville, which is an important manufacturing and coal mining town of about 12,000 inhabitants. This is 14 miles from St. Louis. Eleven miles further on is Mascoutah, a place of nearly 3,000 inhabitants, and several considerable flour mills. A station called Renchler's has been established between Belleville and Mascoutah. After another new town, New Memphis, we come to Venedy, a little village near the Kaskaskia River, 35 miles from St. Louis. The next two stations, Bridgeport and Addieville, are embryo towns. Nashville, which we reach next, is a village of about 2,000 inhabitants whose growth has been checked by the absence of the railroad facilities which stations on the Illinois Central Railroad in the eastern part of the county furnished.

From Nashville the railroad extends nearly due east to Mount Vernon, crossing the Illinois Central Railroad at Ashley, 11 miles from Nashville, 60 miles from St. Louis, 267 miles from Chicago, and 98 miles from Cairo; so, in connection with the Illinois Central, the new road forms a route between St. Louis and Cairo only 158 miles long, which is considerably shorter than any route heretofore open. The Illinois Central, however, I am informed, designs to operate the line in connection with the new St. Louis & Du Quoin road for St. Louis business. Ashley has about a thousand inhabitants. Eight miles east is Woodlawn, which has yet to grow. Eight miles further still, and 76 miles from St. Louis, is Mount Vernon, the county seat of Jefferson county, which, in the early history of the Territory and State of Illinois, was one of its principal places, and in consideration thereof was made one of the three places of holding the Supreme Court, which honor and advantage it has retained to this day, notwithstanding its want for many years of means of access common to hundreds of places elsewhere. Mount Vernon has about two thousand inhabitants.

Mount Vernon, we have said, is the terminus of the

trunk line. From this point one line is to extend southeastward to Shawneetown, and another nearly due east to New Albany, Ind.

The course of this line from Mount Vernon will be a little north of east to Fairfield, the county seat of Wayne county, which is 29 miles further east and five miles further north than the first named town. Here it will cross nearly at right angles the Springfield & Illinois Southeastern Railroad, now in operation. Seventeen miles further east it will pass through or near Albion, the county seat of Edwards county, and about 16 miles further Mount Carmel, the county seat of Wabash county, on the Wabash River opposite the mouth of the White. From Mount Carmel to New Albany the connection will be made by the Louisville, New Albany & St. Louis Air Line Company, which has now ten miles track laid (from a point opposite Mount Carmel, to Princeton, Ind., on the Evansville & Crawfordsville Railroad), and the entire line under contract to be completed by January 1872.

This northern line of the St. Louis & Southeastern will hardly be a "southeastern" road, except by reason of its connections to the Southeast beyond Louisville, but will be practically an east and west line, nearly parallel with the Ohio & Mississippi Railroad until within 50 miles of St. Louis, and generally from 18 to 25 miles south of it. The distance to Louisville by it will be about 250 miles, and it will command a local traffic which will be very little affected by competing lines running in the same direction. Of course this traffic will be equally accessible to St. Louis and Louisville. Probably Louisville will obtain most of the business in Indiana, and St. Louis in Illinois, but our city, by reason of its iron and other manufactures, can maintain a considerable business with sections which will not go westward for ordinary merchandise.

What the managers of the new road call their main line, however, is that to Shawneetown. This will extend directly southeast from Mount Vernon 25 miles to McLeansboro, the county seat of Hamilton county, thence more southerly than southeast to Equality, a town on the Saline River on the western edge of Gallatin county, and thence in an easterly direction to the ancient city of Shawneetown, the county seat of Gallatin county and the southern terminus of the Springfield & Illinois Southeastern Railroad, about nine miles below the mouth of the Wabash on the Ohio River.

The section between Equality and Shawneetown is just about completed. The rest of the line to Mount Vernon is under contract to be completed next season. But this Shawneetown line will be important, like the Louisville line—by reason of connections to be made south of the Ohio River. To secure these a railroad is to be built from that place southeastward through Union, Webster and Hopkins counties in Kentucky about 45 miles to Madisonville, a station on the Evansville, Henderson & Nashville Railroad about 100 miles from Nashville. This will complete a line from St. Louis to Nashville only 284 miles long, little longer than an air line, and will give us our most direct connection with the lines converging at Nashville from Decatur and Montgomery Ala., Chattanooga and the system of railroad in Georgia, and, eventually, from Knoxville and the lines of North and South Carolina. This will be more than a hundred miles shorter than our present best line to Nashville, a saving of more than one-fourth of the distance.

Still another connection to be completed next season, is the branch to Evansville, the growing and ambitious town of Southwestern Indiana. This branch will diverge from the Shawneetown line at McLeansboro, and extend thence eastward to Carmi, the county seat of White county, crossing the Springfield & Illinois Southeastern at Enfield, about 30 miles north of Shawneetown, and thence a little south of east, crossing the Wabash about eight miles from Carmi, nine miles below New Harmony (twice that distance by the river), and reaching Evansville about 25 miles from that crossing, making the total length of the branch from McLeansboro to Evansville about 58 miles.

Thus we will have by the new road lines from St. Louis to three points on the Ohio, with distances as follows:

Shawneetown.....	189 miles.
Evansville.....	159 "
Louisville.....	250 "

This shows a saving of 52 miles to Louisville and 40 miles to Evansville, while Shawneetown, soon to be made accessible by rail for the first time by the Springfield & Illinois Southeastern road, will be brought about 25 miles nearer by the new road.

For its origin the St. Louis & Illinois Southeastern Railway seems to be indebted to the enterprise of certain citizens of Shawneetown and other towns along the line, prominent among whom were Major Bluford Wil-

son (now United States District Attorney) and O. Pool, of Shawneetown; Hon. Joseph J. Castles, of Equality; Hon. S. S. Marshall and A. G. Cloud, of McLeansboro; Hon. Samuel K. Casey and W. T. Green, of Mount Vernon, and last but by no means least, General James H. Wilson, formerly of Shawneetown, but until lately an officer of the Corps of Engineers, U. S. A., early in the war Chief of Topographical Engineers on General Grant's staff, and later a cavalry general with Sheridan in the Shenandoah Valley, and commanding the cavalry of the West at the close of the war, a man of rare energy and ability and professional skill. His first service, however, was in securing a manager for the enterprise, his own duties as an army officer rendering it impossible for him to engage actively in it at that time. The man secured was Gen. Edward F. Winslow, who demonstrated his ability as a railroad builder during the war, and at that time was engaged in constructing the Vandalia road, now one of our most important lines. To Mr. Winslow is due the chief credit for carrying out and improving the original plan so magnificently. For a long time he was charged with want of fixedness of purpose. Men said that he seemed not to know whether Louisville, Evansville or Shawneetown was to be the Ohio River terminus of his road. The solution of the mystery appeared when it was known that he was aiming at all these points and had absolutely secured the construction of the three lines instead of one.

The following is a list of the officers of the company: President—Gen. Edward F. Winslow, of St. Louis.

Vice-Presidents—Hon. Joseph J. Castles, (also Superintendent of Construction, Shawneetown Division); Brevet Major General James H. Wilson, U. S. A., Keokuk, Iowa; Colonel J. F. Alexander, (also President of the St. Louis, Vandalia & Terre Haute Railroad), Greenville.

Treasurer and Secretary—Major C. W. Gardiner, St. Louis.

Chief Engineer—Col. E. C. Rice, St. Louis.

Superintendent—John Lee, Jr., St. Louis.

General Freight and Ticket Agent—G. O. Morton, St. Louis.

Superintendent of Construction, Evansville Division—H. L. Morrill, Evansville, Ind.

Auditor of Accounts—John P. Harris, St. Louis.

Master Mechanic—Archie Thomson.

I have said so much of the railroad that I fear you will hardly have room (as I certainly have not time) for much about the excursion. Suffice it to say that the party numbered about 150 persons, among whom were representatives of many of our principal firms, our leading journals, and our railroads, a goodly and a pleasant company, well disposed to be pleased and with good reason to be; for we found the road well constructed, with an excellent road-bed, and good new rails well tied, unusually handsome and comfortable cars (the whole train, passenger, baggage and express cars, from Jackson & Sharp's Wilmington shops), particularly noticeable by reason of their bright vermilion color, which renders them visible afar off, like a fire on the prairie, new locomotives from Roger's Works, neat and tasteful station houses, and, moreover, the most gentlemanly consideration from the officers of the road, our hosts, and an enthusiastic welcome and the most generous hospitality from the people along the line and at the terminus of the road, who were evidently most heartily glad to be "out of the wilderness." St. Louis.

The Office of Electrician.

The following executive order has been issued by William Orton, President of the Western Union Telegraph Company:

The office of Electrician having been established for the investigation of questions of a scientific or technical character relating to the service, all matters of this kind will in future be under the direction of George B. Prescott, Electrician.

In order to secure greater economy and uniformity, no new kinds of machinery, instruments, insulators, insulating materials, batteries, battery materials, or other apparatus, nor any essential modifications of those now in use, shall be purchased for the company, or manufactured in their shops, except upon the previous written approval of the Electrician; and no employee, without his authority therefor, will be permitted to make experiments at the expense of the company.

Persons now sustaining the relation of Electrical Assistants to the General Superintendents, in either of the divisions, will hereafter be under the direction of the Electrician, in respect of the matters above named, and will at once report to him for instructions.

Such changes or modifications in batteries, or other apparatus, will be made as the Electrician may, from time to time, direct.

—On the 11th inst. the locomotive of a construction train on the Mobile & Ohio Railroad exploded, killing the fireman and seriously injuring the engineer.

MECHANICS AND ENGINEERING.

Removal of Hell Gate Rocks.

The operations upon the Hell Gate rocks now continue constantly, as the injunction lately laid upon the work at Hallett's Point has been removed. This reef is the most formidable to navigation of any obstruction in the neighborhood, and it is there that the work temporarily centres.

The egress of flying stones during the various blastings, which caused the injunction to be issued, has been prevented by laying a cover over the mouth of the pit in the rock, which has been opened by means of a coffer dam. Eight galleries, projecting from this pit, have been begun, the roofs of which are fifteen feet below the surface of the rock. The pit is one hundred feet long, sixty wide, and thirty deep from low water mark.

The galleries have been named after different Generals. Those called Grant, Sherman and Humphreys, are the most advanced, and the Cullom, Wright and McDowell galleries follow. They are all to be extended to a length of two hundred feet, with a width of eight to ten feet. The Grant gallery is the longest thus far, and extends thirty-two feet.

The blasting charges weigh from a quarter of a pound to two pounds. From thirty to fifty of these are discharged at once, and the mouth of each gallery is stopped at the time with gates of logs, interlaced with iron bands, to prevent the fragments flying into the pit. Their force is, however, so great, that the gates are sometimes overthrown. Steam derricks elevate the refuse rock, and steam pumps withdraw the water which percolates into the floor of the pit.

The work in the galleries is by no means inviting to laborers. They labor by dim lamps, with water trickling upon them from above. At first, the Irishmen and Germans employed there ceased working after a few days' occupation, but Cornish miners have now been obtained, who are accustomed to the work, and labor at it cheerfully. In two years the Hallett's Point obstruction will be entirely removed.—*New York Evening Post.*

Export of Rails from Great Britain.

S. W. Hopkins & Co., of New York, have compiled the following statement of the rail exports of Great Britain for the first nine months of the year:

Countries.	Month ending Sept. 30, 1869.			9 mos. ending Sept. 30, 1870.		
	1868.	1869.	1870.	1868.	1869.	1870.
AMERICA—						
United States...	20,638	14,941	33,794	209,368	244,086	313,410
British...	2,017	1,055	4,911	15,323	23,663	29,912
Canada...	5	1	22	2,018	835	3,159
Brazil...	12	67	216	1,976	1,822	2,951
Chili...			2,532	1,440	2,647	12,880
Peru...	1,060	4,096	1,768	2,072	18,720	14,381
EUROPE—						
Russia...	22,290	37,622	30,100	69,927	196,671	193,809
Sweden...	36	292	1,001	1,882	3,438	2,121
Prussia...	1,114	2,438	1,733	5,255	11,402	39,309
Illyria, Croatia, and Dalmatia...	1,106	880	6,709	8,156	21,764	32,917
France...	21	394	94	130	8,920	342
Holland...	378	312	548	20,566	9,875	14,950
Spain and Canaries...	6	547	451	5,514	10,996	9,944
ASIA—						
British India...	5,122	7,564	9,389	58,591	65,830	132,187
Australia...	708	2,011	1,353	7,709	17,338	7,381
AFRICA—						
Egypt...				448	6,025	2,014
Other countries...	8,053	8,017	8,822	26,224	57,542	51,461
Total...	67,597	76,987	103,935	446,273	697,175	862,218
Old iron to all countries...	15,354	11,851	9,416	70,123	79,616	85,711
Pig iron to United States...	19,674	14,925	9,650	63,069	104,620	84,711

Kansas Pacific Shops.

The company's Western shops are located on the east side of Denver, at the junction with the Denver Pacific. The buildings completed are a repair shop, 30x100; a carpenter shop, 30x60; a blacksmith shop, 16x30; an iron store house, 12x20; a machinery store house, 24x40; a general store house, 16x40; a general store house, 26x36, and an engine house. Fifty men are employed in these shops. Work was commenced on a round house with six stalls on the 1st inst. The Denver Pacific has completed the foundation of a round house which will have five stalls.

A New Bridge Company.

The certificate incorporation of the Smith Bridge Company of Toledo, Ohio, has been filed at the Secretary of State's office. The company is organized to manufacture, construct and erect R. W. Smith's patent wooden truss bridge. The capital stock is \$60,000 in shares of \$100. The incorporators are R. W. Smith, J. D. Cook, H. A. Boyd, Paul Jones and E. S. Latty.

Kookuk Bridge.

The iron for the pivot span of the bridge is being brought across the river, and soon this part of the structure will be erected. Six spans are already completed from the Illinois shore. This bridge, when completed, will be, we believe, the first combined highway and railroad bridge ever built over the Mississippi.

Chicago Railroad News.

Contracts.

Messrs. Wells & French, of the firm of Wells, French & Co., associated with Mr. R. A. Conolly, of this city, have the contract for completing the construction of the Chicago & Michigan Lake Shore Railroad from St. Joseph to Nunica, and also for a branch of that road from Holland to Grand Rapids. They have also a contract for constructing the new branch of the Chicago, Burlington & Quincy Railroad from Mendota to Prophetstown, and also the six miles between New Boston and Keithsburg. They have large forces on the main line of the Chicago & Michigan Lake Shore, and on the Mendota & Prophetstown line, and will complete the New Boston & Keithsburg road and commence that from Holland to Grand Rapids this season.

Michigan Central.

Next Monday and thereafter a Pullman Palace car will run through between Chicago and Grand Rapids over the Michigan Central to Kalamazoo, and thence over the new Grand Rapids & Indiana Railroad. This car will be attached to the train leaving Chicago at 9 p. m., and will arrive at Grand Rapids at 8 o'clock the next morning. Returning it will leave Grand Rapids at 8 o'clock p. m. and reach Chicago at 6:15 the next morning. Close connections are also made with the mail train which leaves Chicago at 5 o'clock in the morning and passengers by this train will reach Grand Rapids at 2:15 the afternoon of the same day. By the corresponding train from Grand Rapids passengers leave that place at 8 a. m. and arrive in Chicago at 4 p. m. Thus one may leave Chicago in the morning, spend nearly six hours in Grand Rapids (from 2:15 to 8 p. m.) and be in Chicago in time for breakfast the next morning. This makes Grand Rapids almost a suburban town. This new line brings that important place (16,500 inhabitants with large exports of plaster and lumber) nearer to Chicago than it has ever been before, and the new line can only be improved upon by the other connection of the Michigan Central, the Chicago & Michigan Lake Shore and its branch from Holland to Grand Rapids, now, we understand in course of construction.

Illinois Central.

Some slight changes in the running of trains will be made to-morrow (the 20th inst.). As we go to press these have not yet been determined, but they will barely affect the time of leaving and arriving at Chicago.

It is now expected that the Belleville & Southern Illinois Railroad will be completed to Du Quoin by the 1st of December, after which passenger and freight trains will run regularly between St. Louis and Cairo by this and the Illinois Central south of Du Quoin, making a very direct line, considerably shorter than any other now existing, and nearly as short as it will be possible to make, the proposed Cairo & St. Louis road having a route a little more direct. This will enable the Illinois Central to contend all the more successfully for the trade between St. Louis and the South, as it will then have a line to Columbus considerably shorter than that of the Iron Mountain road, and the only railroad route to Cairo which is not infrequently the head of navigation on the Mississippi in the winter season.

Pittsburgh, Cincinnati & St. Louis.

There is to be a change of time on this road Sunday (November 20), but as we go to press the figures have not been received.

Chicago & Alton.

The new line which is to connect the Dwight & Wemona Branch with the Jacksonville Division is very nearly completed to Washington, where it will form a junction with the Toledo, Peoria & Warsaw Railroad, twelve miles east of Peoria. No more of this line will be constructed this year. This branch extends nearly due west from Wemona about nine miles, and then makes an angle little greater than a right angle to the south. From that point a branch is graded westward to Lacon, about 12 miles; but no iron has been laid on this as yet. It will soon be completed, however, as the iron is arriving daily.

Personal.

Last Tuesday a party of gentlemen representing the Illinois Press Association surrounded Mr. J. H. Whitman, General Western Passenger Agent of the Grand Trunk Railway, in one of the parlors of the Tremont House, and then and there made over to him sundry vessels of silver and cut-glass, by which the Press Association expressed its opinion of Mr. Whitman, which opinion, we understand, is that they were fortunate in making Mr. Whitman's acquaintance on the excursion they made over the Grand Trunk last summer and will long remember him and hope to be remembered by him. Among the presents were a silver ice-pitcher, goblet, bowl and liquor carter, the latter provided with cut-glass decanters with something very choice in them. A presentation speech was made by Mr. W. H. Steel, Chairman of the Executive Committee of the Press Association, and Mr. Whitman responded as well as his surprise would permit.

Freight Eastward.

On the 31st ult. a new tariff was adopted, by which rates to New York are \$1.00 on first class, \$1.25 on second, 85 cents on third, 55 on fourth, 90 on fresh meat, 65 on cured meat, 55 on grain in bulk per hundred and \$1.10 per barrel on flour. To Boston the rates are ten cents higher on first and second class, flour, fresh and cured meats, and five cents

more on the other descriptions of freight. At these rates shipments are very active. A great deal of grain is moving, and considerable quantities of fresh beef and cured meats. Packers are disposed to ship as soon as possible.

NEW PUBLICATIONS.

Der Cosmopolit.—Mr. Julius Silversmith, who is pretty well known in the Far West, especially at Council Bluffs and Omaha, has commenced the publication, in this city, of a monthly journal in the German language "devoted to banking, insurance, emigration, railroads, arts, manufactures, etc." The first number, published September 20, has articles on "The Papacy—France—Germany," "The Principles of Insurance," "Mineral Products of the Northwest," "Banks in Chicago," "Regulation of the Construction of Buildings," articles on Glycerine, Immigration, Railroads, a price-current, and a number of notices of insurance companies. It would seem that a good German commercial journal might flourish here, and as *Der Cosmopolit* has advertisements enough to cover twenty-four of its thirty-six quarto pages, it ought not to lack for sustenance.

Coachmakers' International Journal.—We have received the October number of this periodical, which is the first number of the sixth volume. It is a handsome quarto (the size of the *American Builder*) with sixteen pages of reading matter and five leaves of heavy paper with engravings of new designs for vehicles of different kinds. These are the carriage-maker's fashion-plates, and must be of real value to every man in the trade. The text, too, is rich with information for the trade.

The *Journal* is published in Philadelphia, at three dollars a year.

The *Official Railway News* (New York), of the 13th inst., contains the official report of the Railroad Conductors' Convention, held in Philadelphia last month. This report occupies seventeen columns of that paper. It offers to contribute to the Conductors' Life Insurance Company one dollar for every subscription received from conductors at regular rates (\$3 per year) from this date.

PUBLISHER'S ANNOUNCEMENTS.

Babcock Fire Extinguisher.

Mr. H. E. Sargent, General Superintendent of the Michigan Central Railroad, on the 12th inst., addressed the following letter to F. W. Farwell, Secretary:

DEAR SIR: In reply to your inquiries as to the Fire Extinguishers since being placed upon our road and trains, our record shows the following instances where they have been used:

July 6—Refreshment room in passenger depot at Jackson.
September 5—Baggage car No. 135 on Fast Chicago Express; Conductor Chase.
September 12—Baggage car No. 133, on Fast New York Express; Conductor Harris.
September 29—Coach No. 9 on Fast New York Express; Conductor Chase.

In each of these cases, I am informed, the ready use of the machines undoubtedly saved considerable destruction of property and delay of trains. Truly, yours,

H. E. SARGENT, General Superintendent.

These extinguishers have already proved themselves so advantageous to railroad companies that Mr. H. I. Higgins, Purchasing Agent of the Chicago, Burlington & Quincy Company, has ordered two hundred of them for protection of their shops, trains and station houses.

Railroad Gazette.

"Keeps its readers better posted as to what is transpiring in the railroad world than any journal of the kind we have ever seen."—*Little Rock (Ark.) Republican.*

"A model of class journalism and of decided value to every one even remotely interested in transportation."

"When a paper is published with the intention of making it prosperous by making it indispensable to its class of readers, it is on the right track, and to the existence of such a spirit must be attributed the marked success of the journal in question."—*The American Builder.*

"Die RAILROAD GAZETTE (ein Journal für den Verkehr) ist besonders für jeden Ingenieur, und jeden bei Eisenbahnen Angestellten, vom Condukteur, Heizer und Locomotivenführer angefangen, bis zu den Contraktoren, Maschinisten, Superintenden, den Direktoren und Eisenbahn-Präsidenten nützlich, ja unentbehrlich, und ausserdem auch noch sonst für Jedermann interessant. Die Nummer vom 24. September enthält unter vielem Anderen, auf Eisenbahnen bezügliche, auch Aufsätze über 'Eisenbahnen Consolidation,' 'über den Betrieb des Güterverkehrs in Amerika,' den Vorschlag zu einem 'Verbande der Eisenbahnbeamten zur Verhütung von Unglücksfällen';—dann Notizen und Verhandlungen der Eisenbahnwagen-Maler zu Boston, der Amerikanischen Eisenbahn-Maschinisten in Philadelphia;—ferner einen Aufsatz über die 'Fabrikation von Bessemer Stahl,' eine illustrierte Abhandlung über 'Vorrichtungen zum Umkehren der Bewegung' (aus dem 'English Mechanic and Mirror of Science'), sowie über 'Normal-Schienen-Sektionen' (aus Engineering); endlich die illustrierte Beschreibung eines Schneepfluges für Eisenbahnen."—*Deutsch-Amerikanische Gewerbe und Industrie Zeitschrift.*

—A very considerable riot occurred east of Mendon, on the line of the Quincy & Carthage Railroad, on the 13th inst., in consequence of the sub-contractors refusing to pay their men. The laborers threatened to burn a valuable bridge, and do other damage until they were paid for the work done. A force was sent from Quincy to quell it.

WANTS.

Wanted Advertisements will be inserted under this head at ten cents per line for the first insertion, and five cents per line for each subsequent insertion.

WANTED—A completed file of the *RAILROAD ADVOCATE* published in New York by Zerah Colburn about 15 years ago. A purchaser can be found by applying at this office personally or by letter.

AN ENGINEER experienced in railroad location and construction as Principal Assistant and Chief is open to an engagement. For further information inquire of the editor of this paper.

WANTED—Twenty-five cents each will be paid for a few perfect copies of the first quarto volume of the *RAILROAD GAZETTE* of the following dates: June 25, August 13 and August 20, all 1870. Address: A. N. KELLOOG, No. 101 Washington street, Chicago.

WANTED—Every Railway Traveler in the United States and the Dominion of Canada wants every railway company to use the Thomas Safety Baggage Check. It is in use on over sixty of the best managed roads in the country and has been during the past three years, and not one piece of baggage to which this check has been attached has been lost or mis-carried. Every railroad man upon whose road it is in use says: "We are fully satisfied after a thorough trial and practical use of the Thomas Safety Baggage Check that both for local and through business it has no equal. It is cheaper, more satisfactory and better adapted to the business than any other check in use." All information in reference to the Thomas Safety Baggage Check will be given by addressing G. F. THOMAS, editor Appleton's Railway Guide, 90, 92 and 94 Grand Street, New York.

SUBSCRIBERS to the *RAILROAD GAZETTE* who have preserved files from April 1 to October 1, 1870, may have this First Quarto Volume bound, at a charge of \$1.50, by sending them to this office.

Great Western R. W. of Canada.

The Directors of the Great Western Railway of Canada invite tenders for the construction of the Second Division of the CANADA AIR LINE. Plans and specifications for the Division from *Aylmer to Simcoe* will be on exhibition at the office of the Chief Engineer, George Lowe Reid, Esq., Hamilton, from the 8th to the 25th November.

All Tenders must be in the hands of the undersigned by 10 o'clock on the morning of the 25th instant—sealed and marked "Tender for construction of Second Division Canada Air Line" JOSEPH PRICE, Treasurer, etc. Chief Office, Hamilton, Ontario, Nov. 7, 1870.



On Railroad Trains.

See Letter from H. E. SARGENT, General Superintendent Michigan Central Railroad,

ON PAGE 181.

F. W. FARWELL, Secretary,
122 Washington St., Chicago.

ANDREW CARNEGIE, { THOS. M. CARNEGIE,
PRESIDENT. VICE-PRESIDENT.
ANDREW KLOMAN, GEN. SUT'.

THE UNION IRON MILLS,
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Sole Manufacturers, under our own Patents, of
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"Upset" BRIDGE LINKS

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WALTER KATTE, Western Agent.

Baldwin Locomotive Works.

M. BAIRD & CO., Philadelphia.

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Railroad Cars, Wheels and Axles, Chilled Tires,

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Wheels of all sizes constantly on Hand.

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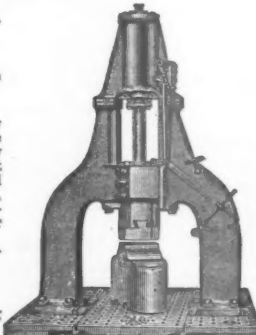
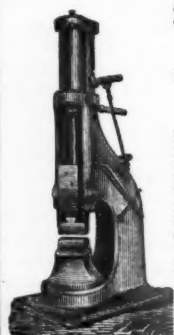
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Simple in Construction—Powerful in Action—Convenient in Handling—Moderate in Price!

These Hammers have our Patent Skew Ram, which secures the most extensive die surface, and our patent valve gear, by which is accomplished, with the most perfect adjustment, either the heavy dead blow for drawing down work, or the light, quick blow for finishing, AND THIS WITH ONLY TWO MOVING PIECES—NOTHING TO GET OUT OF ORDER.

All sizes, from 100 lbs. upwards, with single or double frames.

ENGINE LATHES,

Extra Strong and Heavy, capable of doing the heaviest and most accurate work.



Also, our PATENT SCREW-CUTTING LATHES, which will do either general turning or screw cutting, without change of gear-wheels.

The New Jersey Steel and Iron Co.,
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WOULD CALL SPECIAL ATTENTION TO THEIR

MARTIN STEEL!

Acknowledged by all who have used it to be the best material now made for

Firebox Plates, Locomotive Crank Pins, Piston Rods, Axles,

And all the finer machine purposes, such as

Rollers for Cotton Machinery, Lathe Screws, Sewing Machine Work, &c., &c.

The special features of this Steel are its REMARKABLE TOUGHNESS, its softness and entire freedom from hard spots, which obviate the necessity of annealing before turning.

The process by which this Steel is made differs entirely from any other in use, enabling it to be sold at lower prices than any other good steel, while it possesses properties hitherto unknown, and of the greatest importance for many uses.

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Rail Road and Mining Register,

[Established 31st May, 1856.]

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—AT—

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J. P. LESLEY, EDITOR.

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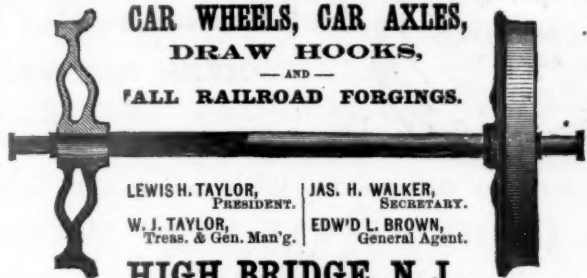
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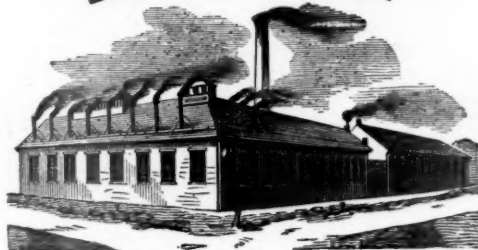
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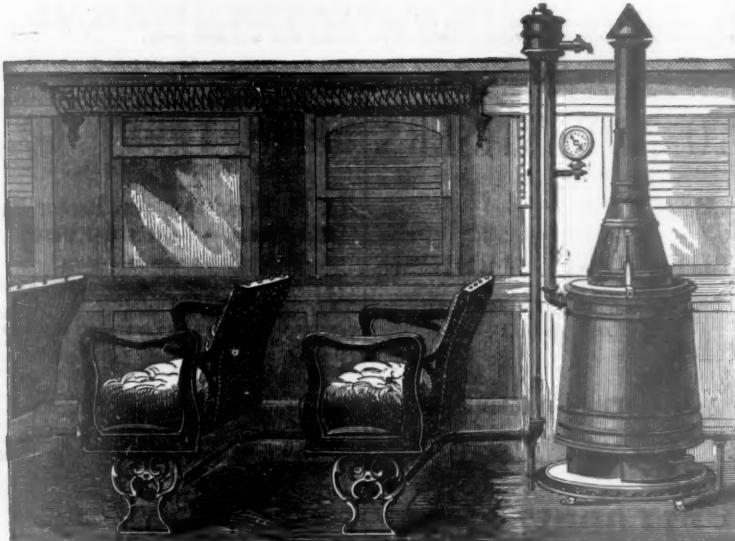
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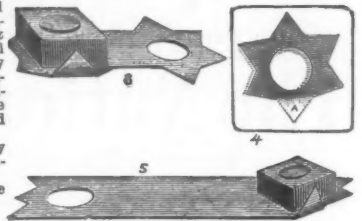
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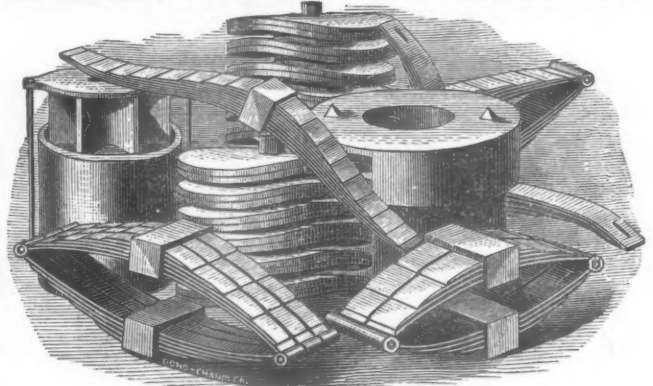
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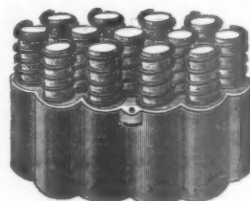


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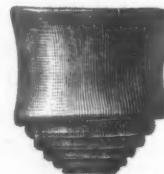
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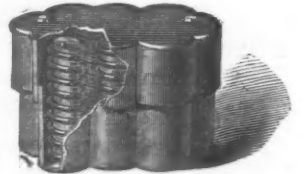
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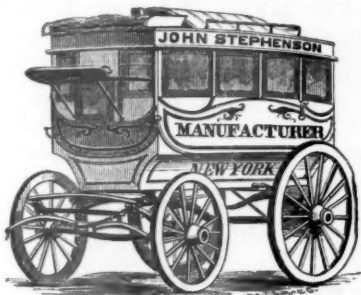
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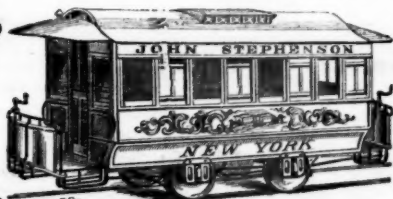
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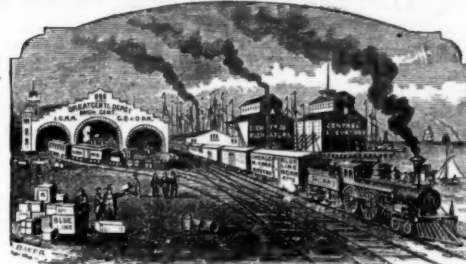
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Have Choice of Seats in Clean Coaches, and on Night
Trains, a full night's rest in Palace Sleeping Cars.

BAGGAGE CHECKED THROUGH BY THIS ROUTE ONLY!

PASSENGERS FROM CHICAGO can obtain these Advantages only by
the MILWAUKEE DIVISION of the CHICAGO & NORTHWESTERN R.R.

SPECIAL NOTICE.—Passengers destined to any place
in Wisconsin, Minnesota, or Northern Iowa, either on or off the
Lines of this Company, who cannot procure Through Tickets to
their destination, should purchase their Tickets TO MILWAU-
KEE, as this is the Great Distributing Point for these States.

A. V. H. CARPENTER,
Gen. Pass. Agt. Milwaukee.

S. S. MERRILL,
Gen. Manager, Milwaukee

KANSAS PACIFIC RAILWAY.

Great Smoky Hill Route,

Now Completed and Open for Business Through to

DENVER, COLORADO.

There Connecting with the DENVER PACIFIC RAILROAD for CHEYENNE, forming,
in Connection with the UNION and CENTRAL PACIFIC RAILROADS,
another ALL-RAIL ROUTE to

CALIFORNIA, NEVADA, UTAH, MONTANA, WYOMING, COLORADO, &c.

The most available Passenger and Freight Route to Lawrence, Topeka, Junction City, Abilene, Salina,
Hays, KIT CARSON, River Bend, DENVER, CHEYENNE, OGDEN, SALT LAKE CITY,

Sacramento, and San Francisco.

Close Connections are made in Union Depots at KANSAS CITY and STATE LINE with Ex-
press Trains of the HANBIBAL & ST. JOSEPH, NORTH MISSOURI and MISSOURI PACIFIC RAILROADS.
Southern Overland Passenger and Mail Coaches leave Kit Carson daily for Pueblo, Trinidad, Fort
Union, Santa Fe, &c.

Hughes & Co.'s Splendid Concord Coaches leave Denver daily for Central City, Georgetown, &c.
Passenger and Freight Rates always as low and conveniences as ample as by any other Route.

PULLMAN'S PALACE CARS ACCOMPANY NIGHT EXPRESS TRAINS.

Through Tickets can be obtained at all principal ticket offices. Be careful to ask for tickets
via Kansas Pacific Railway, "Smoky Hill Route."

5,000,000 Acres of Farming Lands For Sale!

Situated along the line of this Great National Railway. For particulars, address JNO. P. DEVEREUX,
Land Commissioner, Lawrence, Kansas.

R. B. GEMMELL, Gen. Freight & Ticket Agt. A. ANDERSON, Gen. Supt.

THE ERIE & PACIFIC DISPATCH CO.

Are Authorized Freight Agents.

For information, Contracts, and Bills of Lading, apply at their office, 64 Clark Street, Chicago.

H. H. RAPP, AGT.

J. E. FRENCH.

W. S. DODGE.

D. W. CROSS.

Winslow Car Roofing Company.

PATENT IRON CAR ROOFS.

Established, 1859.

No. 211 Superior St. CLEVELAND, O.

Over 20,000 Cars covered with this Roof! We claim that these
Roofs will keep Cars dry, and will last as long as the
Cars they cover without any extra expense
after once put on.

SEND FOR CIRCULARS.

CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:15 A. M. Cedar Rapids Pass 9:15 P. M. Night Mail.
10:30 A. M. Pacific Express. 9:15 P. M. Rock Island Pass.
10:30 A. M. Rock Island Exp. 4:00 P. M. Dixon Passenger.
For Sterling, Rock Island, Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

UNION PACIFIC R. R.

For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, and all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO Hours. 1st Class Fare. FROM CHICAGO Days. 1st Class Fare.
To OMAHA..... 23 \$20.00 To SACRAMENTO, 4 1/2 \$118.00
" DENVER..... 52 70.75 " SAN FRANCISCO, 5 118.00
TRAINS ARRIVE:—Night Mail, 7:00 a. m.; Dixon Passenger, 11:10 a. m.; Pacific Express, 3:50 p. m.; Rock Island Express, 3:50 p. m.; Cedar Rapids Passenger, 6:50 p. m.

FREEPORT LINE.

9:00 A. M. & 9:45 P. M. For Belvidere, Rockford, Freeport, Galena, Dunleith, and St. Paul.
4:00 P. M., Rockford Accommodation.
5:30 P. M., Geneva and Elgin Accommodation.
6:10 P. M., Lombard Accommodation.
5:50 P. M., Junction Passenger.

TRAINS ARRIVE:—Freeport Passenger, 2:30 a. m., 3:00 p. m.; Rockford Accommodation, 11:10 a. m.; Geneva and Elgin Accommodation, 8:45 a. m.; Junction Passenger, 8:10 a. m.; Lombard Accommodation, 6:50 a. m.

WISCONSIN DIVISION.

Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:
10:00 A. M. DAY EXPRESS, for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.

3:00 P. M., Janesville Accommodation.
5:00 P. M. NIGHT EXPRESS, for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Menasha, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.

5:30 P. M., Woodstock Accommodation.
6:20 P. M., Barrington Passenger.
TRAINS ARRIVE:—5:30 a. m., 7:45 a. m., 1:10 a. m., 1:00 p. m. and 7:15 p. m.

MILWAUKEE DIVISION.

MILWAUKEE MAIL, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee,..... 8:00 A. M.
EXPRESS, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee,..... 9:45 A. M.
EVANSTON PASSENGER,..... 11:40 A. M.
HIGHLAND PARK PASSENGER,..... 1:15 P. M.
MILWAUKEE ACCOMMODATION, with Sleeping Car attached,..... 11:00 P. M.
EVANSTON ACCOMMODATION, (Daily) from Wisconsin Div. Depot,..... 1:30 P. M.
KENOSHA ACCOMMODATION, (Sundays excepted) from Wells St. Depot,..... 4:15 P. M.
AFTERNOON PASSENGER, from Milwaukee Div. Depot,..... 5:00 P. M.
WAUKEGAN ACCOMMODATION, (except Sundays) from Wells St. Depot,..... 5:25 P. M.
WAUKEGAN PASSENGER, (Sundays excepted) from Wells St. Depot,..... 6:15 P. M.
TRAINS ARRIVE:—Night Accommodation, with Sleeping Car, 5:00 a. m.; Day Express, 4:10 p. m. Milwaukee Mail, 10:10 a. m.; Afternoon Passenger, 8:00 p. m.; Waukegan Accommodation, 8:25 a. m.; Kenosha Accommodation, 9:10 a. m.; Evanston Accommodations, 1:40 and 4:00 p. m.; Waukegan Passenger, 7:55 a. m.; Highland Park Passenger, 3:45 p. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS Can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD,
Gen. Ticket Agt.

GEO. L. DUNLAP,
Gen'l Supt.

Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, CHICAGO. | MILWAUKEE & CHICAGO DEPOT, MILWAUKEE.

THE DIRECT ROUTE!

CHICAGO, RACINE & MILWAUKEE,

—TO—

Beloit, Savanna, Clinton, Ft. Byron, Davenport, Mineral Point, Madison, Freeport, Fulton, Lyons, Rock Island, Sabula, Galena, Dubuque, Des Moines, Council Bluffs, OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD,
Gen. Ticket Agent.

D. A. OLIN,
Gen. Superintendent.

CRERAR, ADAMS & CO.,

MANUFACTURERS AND DEALERS IN

Railroad Supplies!

—AND—

CONTRACTORS' MATERIAL.

11 and 13 Wells Street,

CHICAGO, ILL.

Manufacturers of IMPROVED HEAD-LIGHTS for Locomotives, Hand and Signal Lanterns, Car and Station Lamps, Brass Dome Casings, Dome Mouldings, Cylinder Heads, and Car Trimmings, of Every Description.



Pan-Handle

—AND—

Penn'a Central Route East!

SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO

PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Saturday, JULY 10th, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KINZIE STS., WEST SIDE.]

8:10 A. M. DAY EXPRESS.

[SUNDAYS EXCEPTED.] Via Richmond. Arriving at

COLUMBUS... 2:35 A. M. HARRISBURG... 10:35 P. M. NEW YORK... 6:40 A. M. WASHINGTON... 5:50 A. M.
PITTSBURGH... 12:00 M. PHILADELPHIA... 3:10 A. M. BALTIMORE... 9:30 A. M. BOSTON... 5:05 P. M.

7:40 P. M. NIGHT EXPRESS.

[SATURDAYS EXCEPTED.] Arriving at:

COLUMBUS... 11:15 A. M. HARRISBURG... 5:10 A. M. NEW YORK... 12:10 P. M. WASHINGTON... 1:10 P. M.
PITTSBURGH... 7:05 P. M. PHILADELPHIA... 9:35 A. M. BALTIMORE... 9:00 A. M. BOSTON... 11:50 P. M.

Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

CINCINNATI & LOUISVILLE AIR LINE SOUTH.

35 Miles the Shortest Route to Cincinnati.

18 Miles the Shortest Route to Indianapolis and Louisville.

2 Hours the Quickest Route to Cincinnati!

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

— QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO —

New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,

AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

8:10 A. M. 7:40 P. M.

(Sundays excepted) Arriving at

LOGANSPORT... 1:15 P. M. LOGANSPORT... 1:30 A. M.
KOKOMO... 3:35 P. M. KOKOMO... 3:45 A. M.
CINCINNATI... 9:30 P. M. CINCINNATI... 10:30 A. M.
INDIANAPOLIS... 5:00 P. M. INDIANAPOLIS... 5:40 A. M.
LOUISVILLE... 11:30 P. M. LOUISVILLE... 8:50 P. M.

Lansing Accommodation: Leaves 5:10 P. M. Arrives 8:55 A. M.

PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

Ask for Tickets via COLUMBUS for the East, and via "The AIR LINE" for Cincinnati, Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 RANDOLPH STREET, CHICAGO, and at Principal Ticket Offices in the West and Northwest.

WM. L. O'BRIEN,
Gen. Pass. and Ticket Agent, Columbus.

I. S. HODSDON,
Northwestern Pass. Agt. Chicago.

D. W. CALDWELL Gen Supt. Columbus.

MOORE

Steel Elastic Car Wheel Co.

OF NEW JERSEY.

Proprietors of

MOORE'S PATENT

FOR THE MANUFACTURE OF

ELASTIC CAR WHEELS,

FOR PASSENGER AND SLEEPING COACHES.

Noiseless, Safe, Durable and Economical.

Also, Manufacturers of

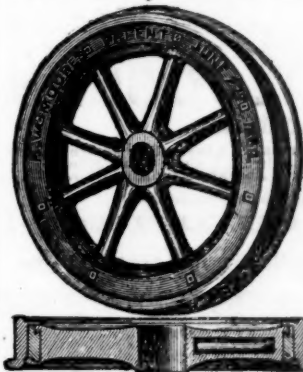
CAR WHEELS OF EVERY DESCRIPTION.

H. W. MOORE, President.

JAS. K. FROTHINGHAM, Secretary.

F. W. BLOODGOOD, Treasurer.

Works, cor. Green and Wayne Sts., JERSEY CITY, N. J.
P. O. Address— Box 129, Jersey City, N. J.



American Compound Telegraph Wire.

More than 3000 Miles now in Operation.

Demonstrating beyond question its superior working capacity, and great ability to withstand the elements. For RAILROAD LINES, connecting a single wire with a large number of Stations, and for long circuits, this wire is peculiarly adapted; the large conducting capacity secured by the copper, with other advantages, rendering such lines fully serviceable during the heaviest rains.

Having a core of steel, a small number of poles only are required, as compared with iron wire construction, thereby preventing much loss of the current from escape and very materially reducing cost of maintenance. OFFICE AMERICAN COMPOUND TELEGRAPH WIRE CO., 234 West 29th Street, New York.

BLISS, TILLOTSON & CO., Western Agents,
247 South Water Street, Chicago.

THE FAVORITE THROUGH PASSENGER ROUTE!

Chicago, Burlington & Quincy RAILROAD LINE.

3 THROUGH EXPRESS TRAINS DAILY!

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
TO OMAHA, - - -	23	\$20.00	TO DENVER, - - -	2 1/2	\$65.00
" ST. JOSEPH, - -	21	19.50	" SACRAMENTO, - -	4 1/2	118.00
" KANSAS CITY, -	22	20.00	" SAN FRANCISCO, -	5	118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

BURLINGTON, KEOKUK, COUNCIL BLUFFS & OMAHA LINE

7:40 A. M. MAIL AND EXPRESS. (Except Sunday,) stopping at all stations; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c.

10:45 A. M. PACIFIC FAST LINE. (Except Sunday,) stopping at Riverside, Hinsdale, Aurora, Leland, Mendota, Princeton, Buda, Kewanee, Galva, Galesburg, and all stations West and South of Galesburg.

ELEGANT DAY COACHES and PULLMAN PALACE DRAWING ROOM CARS are attached to this train daily from Chicago

TO COUNCIL BLUFFS & OMAHA WITHOUT CHANGE!

5:00 P. M. EVENING EXPRESS. (Daily, except Saturday,) for Burlington, Ottumwa, Des Moines, Nebraska City, Council Bluffs, Omaha, and all points West. Pullman Drawing Room Sleeping Car attached to this train daily from Chicago to Ottumwa, and Elegant Day Coaches, from Chicago to Council Bluffs and Omaha, without change!

11:30 P. M. NIGHT EXPRESS. (Daily, except Saturday,) stopping at all principal Stations between Chicago and Burlington. Elegant Day Coaches, and a Pullman Palace Sleeping Car are attached to this Train from Chicago to Burlington, without change! This is the Route between

CHICAGO, COUNCIL BLUFFS & OMAHA,

—RUNNING THE CELEBRATED—

Pullman Palace Dining Cars!

49 MILES THE SHORTEST ROUTE BETWEEN

Chicago & Keokuk,

And the Only Route Without Ferrying the Mississippi River!

QUINCY, ST. JOSEPH, LEAVENWORTH & KANSAS CITY LINE.

10:45 A. M. PACIFIC EXPRESS. (Daily, except Sunday,) with SLEEPING CARS attached, running from Chicago to KANSAS CITY, Without Change!

5:00 P. M. EVENING EXPRESS. (Daily,) with Pullman Palace Drawing Room Sleeping Car attached running through from Chicago to QUINCY, KANSAS CITY, LAWRENCE, TOPEKA and DENVER, Without Change.

11:30 P. M. NIGHT EXPRESS. (Daily, except Saturday,) with Pullman Palace Sleeping Car attached from Chicago to GALESBURG: PALACE DAY COACHES from Chicago to QUINCY, Without Change!

64 MILES THE SHORTEST AND ONLY ROUTE BETWEEN

Chicago and Kansas City!

WITHOUT CHANGE OF CARS OR FERRY.

115 MILES The Shortest Route bet. Chicago & St. Joseph.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND

Atchison, Weston, Leavenworth, Lawrence,

AND ALL POINTS ON THE KANSAS PACIFIC R.R.

Local Trains Leave: RIVERSIDE & HINSDALE ACCOMMODATION, 7:00 A. M. 1:30 & 6:15 P. M.
 MENDOTA PASSENGER, 4:15 P. M.
 AURORA PASSENGER, 5:30 P. M.

Ask for Tickets via Chicago, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, and at Company's office in Great Central Depot, Chicago at as low rates as by any other route.

ROBT HARRIS, Gen'l Superintendent, CHICAGO.
SAM'L POWELL, Gen'l Ticket Agent, CHICAGO.
E. A. PARKER, Gen. West. Pass. Agt., CHICAGO.

THE GREAT THROUGH PASSENGER ROUTE TO KANSAS

IS VIA THE OLD RELIABLE

HANNIBAL & ST. JOSEPH SHORT LINE.

Crossing the Mississippi at Quincy and the Missouri at Kansas City on New Iron Bridges; running Three Daily Express Trains, Through Cars and Pullman Sleeping Palaces from Chicago & Quincy to St. Joseph & Kansas City.

The Advantages gained by this Line over any other Route from Chicago, are:

115 MILES THE SHORTEST!

To St. Joseph, Atchison, Hiawatha, Waterville, Weston, Leavenworth,

64 MILES THE SHORTEST!

To Kansas City, Fort Scott, Lawrence, Ottawa,

Garnett, Iola, Humboldt, Topeka, Burlingame, Emporia, Manhattan, Fort Riley, Junction City, Salina, Ellsworth, Hays, Sheridan, Olathe, Paola, Cherokee Neutral Lands, Baxter Springs, Santa Fe, New Mexico, and all Points on the KANSAS PACIFIC, and MISSOURI RIVER, FT. SCOTT & GULF R.R.'s, with which we connect at Kansas City Union Depot.

THIS BEING THE SHORTEST LINE AND QUICKEST, is consequently the cheapest; and no one that is posted thinks of taking any other Route from Chicago to reach principal points in

Missouri, Kansas, Indian Territory, or New Mexico.

DAILY OVERLAND STAGES from west end Kansas Pacific Railway, for Pueblo, Santa Fe, Denver, and points in Colorado and New Mexico.

This is also a most desirable Route, via St. Joseph, to Brownsville, Nebraska City, Council Bluffs, and Omaha, connecting with the Union Pacific Railroad for Cheyenne, Denver, Salt Lake, Sacramento, San Francisco, and the Pacific coast.

Through Tickets for Sale at all Ticket Offices. Baggage Checked Through, and Omnibus Transfers and Ferryage avoided.

P. B. GROAT, Gen. Ticket Agent.

HANNIBAL, MO.

GEO. H. NETTLETON, Gen. Supt.

HANNIBAL, MO.

Old, Reliable, Air-Line Route!

CHICAGO, ALTON & ST. LOUIS R. R.

SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO

Bloomington, Springfield, Jacksonville, Alton

—AND—

ST. LOUIS!

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS WITH MORNING AND EVENING TRAINS

—FOR—

ATCHISON, LEAVENWORTH, KANSAS CITY,

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

TRAINS leave Chicago from the West-side Union Depot, near Madison Street Bridge.

EXPRESS MAIL, [Except Sundays].....	8:10 A. M.
LIGHTNING EXPRESS, [Except Saturdays and Sundays].....	9:50 P. M.
NIGHT EXPRESS, [Daily].....	6:00 P. M.
JOLIET ACCOMMODATION, [Except Sundays].....	4:40 P. M.
JACKSONVILLE EXPRESS, [Daily].....	6:00 P. M.

Trains arrive at Chicago at 8:00 P. M., 8:30 A. M. and 6:00 A. M. Joliet Accom., 9:40 A. M.

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

Pullman's Palace Sleeping and Celebrated Dining Cars!

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freight as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent.

J. C. McMULLIN, Gen. Supt.

North Missouri R. R.

PASSENGERS FOR

KANSAS AND THE WEST,

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

—IS—

11 MILES SHORTER than any other Route!

BETWEEN

St. Louis and Kansas City.

15 Miles Shorter between ST. LOUIS and LEAVENWORTH

—AND—

49 MILES SHORTER TO ST. JOSEPH!

THAN ANY OTHER LINE OUT OF ST. LOUIS.

Three Through Express Trains Daily!

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

FOR TICKETS, apply at all Railroad Ticket Offices, and see that you get your Ticket via St. Louis and North Missouri Railroad.

C. N. PRATT, Gen. Eastern Agt.,
111 Dearborn-st. CHICAGO.S. H. KNIGHT, Gen. Superintendent,
ST. LOUIS.

JAS. CHARLTON, Gen. Pass. and Ticket Agt., St. Louis.

Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

KANSAS CITY, LEAVENWORTH & ATCHISON,

WITHOUT CHANGE OF CARS!

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R.R.'s, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

ALL POINTS WEST!

At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

PALACE SLEEPING CARS on all NIGHT TRAINS.
 Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canada. Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.

W. B. HALE,
 Gen. Pass. and Ticket Agt.

THOS. MCKISSOCK,
 General Superintendent.

THREE HOURS IN ADVANCE OF ALL OTHER ROUTES!

Sixty-One Miles the Shortest Line! Only 27 Hours!

—FROM—

CHICAGO TO NEW YORK.

Pittsburgh, Ft. Wayne & Chicago and Pennsylvania Central

IS THE ONLY ROUTE RUNNING ITS ENTIRE TRAIN THROUGH TO PHILADELPHIA AND NEW YORK, AND THE ONLY ROUTE RUNNING

THREE DAILY LINES OF PULLMAN'S DAY AND SLEEPING PALACES,

—FROM CHICAGO TO—

PITTSBURGH, HARRISBURG, PHILADELPHIA & NEW YORK,

WITHOUT CHANGE!

WITH BUT ONE CHANGE TO

BALTIMORE, PROVIDENCE, NEW HAVEN,
HARTFORD, SPRINGFIELD, WORCESTER AND BOSTON!

And the Most Direct Route to Washington City.

Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:

LEAVE:	Mail	Fast Express	Pacific Exp.	Night Exp.	YANKEES AGT
CHICAGO	5.50 A. M.	11.00 A. M.	5.15 P. M.	9.00 P. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
PLYMOUTH	9.50 " "	1.50 P. M.	9.10 " "	2.13 A. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
PORT WAYNE	13.40 P. M.	3.30 " "	11.30 " "	5.30 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
LIMA	3.15 " "	3.30 " "	1.25 A. M.	8.10 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
FOREST	4.37 " "	4.55 " "	2.43 " "	9.40 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
CRESTLINE	6.00 A. M.	6.55 " "	4.30 " "	13.05 P. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
MANSFIELD	6.12 " "	7.16 " "	5.00 " "	13.34 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
ORRVILLE	9.05 " "	8.43 " "	6.45 " "	3.27 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
ALLIANCE	10.45 " "	9.55 " "	8.40 " "	3.55 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
ROCHESTER	D. 2.05 P. M.	12.17 A. M.	10.53 " "	6.02 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
PITTSBURGH	3.15 " "	12.50 " "	12.45 P. M.	7.50 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
BLAIRSVILLE BRANCH	6.05 " "	3.37 " "	2.49 " "	9.54 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
JOHNSTOWN	6.56 " "	4.38 " "	3.37 " "	10.42 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
CRESSON	7.58 " "	5.45 " "	4.38 " "	11.43 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
ALTOONA	8.05 " "	6.40 " "	5.45 " "	13.35 A. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
HUNTINGDON	10.21 " "	7.04 " "	7.04 " "	1.45 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
LEWISTOWN	11.44 " "	8.23 " "	8.23 " "	2.59 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
HARRISBURG	3.10 A. M.	8.23 " "	10.45 " "	5.20 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
LANCASTER	3.40 " "	P. M.	12.15 A. M.	7.00 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
DOWNINGTON	5.00 " "	1.40 " "	1.40 " "	8.16 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
ARRIVE:					
PHILADELPHIA	6.30 " "	12.20 " "	3.10 " "	9.40 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
NEW YORK, VIA PHILADELPHIA	10.41 " "	3.00 " "	6.43 " "	1.03 P. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
NEW YORK, VIA ALLENTOWN	3.50 " "	12.10 " "	4.30 " "	9.00 A. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
BALTIMORE	12.10 " "	3.40 " "	5.50 " "	1.00 P. M.	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!
WASHINGTON	9.00 P. M.	5.50 A. M.	5.05 P. M.	11.50 " "	Leaves Chicago daily, except Sunday; the entire Train—Baggage, Day and Pullman's Palace Cars—RUNNING THROUGH from Chicago to New York, via Mantua Junction; leaves Pittsburgh daily, except Monday. This train reaches NEW YORK in time to make close connection for BOSTON! No other Route through New York makes it! Arrives in BALTIMORE Five Hours, and WASHINGTON Four Hours in Advance of Rival Routes!

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CONNECTIONS CERTAIN! as Trains on this Railway will, when necessary, wait from one to two hours for Western trains.

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Baggage Checked at that Station for all Points East.

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7:30 A. M. MAIL TRAIN.
VIA OLD ROAD AND AIR LINE. SUNDAYS EXCEPTED.

Leaves 221 Street 7:45 A. M. Stops at all Stations. Arrives—Toledo, 6:30 P. M.

11:30 A. M. SPECIAL NEW YORK EXPRESS,
— AIR LINE. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, 11:45 A. M. Arrives—Elkhart, 2:55 P. M.; Cleveland 10:40 P. M.; Buffalo, 4:10 A. M.; New York, 8:30 P. M.; (Chicago Time) Boston, 11:45 P. M.

This Train has PALACE SLEEPING COACH Attached, Running

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Only Thirty Hours, Chicago to New York!

5:15 P. M. ATLANTIC EXPRESS (Daily),
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Leave—Twenty-Second Street 5:30 P. M. Arrives—Laporte, 8:10 P. M. (Stops 20 minutes or Supper); arrives at Toledo, 2:50 A. M.; Cleveland, 7:25 A. M. (30 minutes for Breakfast); arrives at Buffalo, 1:50 P. M.; Rochester, 5:10 P. M. (30 minutes for Supper); connects with Sleeping Coach running Through from Rochester to Boston Without Change, making but One Change between Chicago and Boston.

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running THROUGH FROM CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives at NEW YORK, 6:40 A. M.

9:00 P. M. NIGHT EXPRESS
VIA AIR LINE. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, 9:15 P. M. Arrives—Toledo, 6:00 A. M. (30 minutes for Breakfast); arrives at Cleveland, 10:35 A. M.; Buffalo, 5:30 P. M.; New York, 11:00 A. M.; Boston, 3:50 P. M.

KALAMAZOO DIVISION.

Leave Chicago 11:30 A. M. Arrive at Kalamazoo 5:30 P. M.; Grand Rapids, 8:15 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 7:10 A. M.; Grand Rapids, 10:20 A. M.

Elkhart Accommodation leaves Chicago, 3:30 P. M. Arrives at Elkhart, 8:20 P. M.

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8:30 P. M. FAST LINE. Saturdays Excepted.
Arriving at ST. LOUIS at 8:00 A. M.

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9:30 A. M. CAIRO MAIL, Sundays Excepted.
Arriving at Cairo 2:30 A. M., Memphis 12:40 P. M., Mobile 2:40 A. M.
Vicksburg 9:30 A. M., New Orleans 11:10 A. M.

8:30 P. M. CAIRO EXPRESS, Except Saturdays.
Arriving at Cairo 3:15 P. M., Memphis 2:30 A. M., Vicksburg 5:00 P. M., New Orleans 1:30 A. M.

4:55 P. M. CHAMPAIGN PASSENGER,
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Arriving at Chicago 3:15 P. M., El Paso 4:05 P. M., Peoria 5:40 P. M., Canton 7:14 P. M., Bushnell 8:59 P. M., Keokuk 11:26 P. M., Warsaw 12:05 A. M.

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HYDE PARK TRAIN...	6:00 A. M.	8:15 A. M.	HYDE PARK TRAIN...	3:10 P. M.	5:25 P. M.
HYDE PARK TRAIN...	12:10 P. M.	1:30 P. M.			

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(SUNDAYS EXCEPTED.) Arrives at Michigan City 1:13 P. M.; New Buffalo 1:32; Niles 2:15; (Dinner); Kalamazoo 3:32 P. M.; Battle Creek 4:23; Marshall 4:48; Jackson 5:45; Detroit 7:55; London 12:05 A. M.; Hamilton 2:35 A. M.; Toronto 9:20; Suspension Bridge 3:55; Rochester 7:00 A. M.; Albany, 2:00 P. M.; NEW YORK, 6:25; BOSTON, 11:59 P. M. This train connects at ROCHESTER (7:00 A. M.) with

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9:00 P. M. NIGHT EXPRESS.

(SAT. & SUN. EXCEPTED.) Arrives at Michigan City, 11:03 P. M.; Niles, 12:25 A. M.; Kalamazoo, 2:00; Marshall, 3:12; Jackson, 4:25; Grand Trunk Junction, 7:00; Detroit, 7:30; London, 1:45 P. M.; Hamilton, 4:35; Toronto, 9:35; Niagara Falls, 6:15; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:25 A. M.; Rome, 1:55; Utica, 2:25; Albany, 6:30 A. M.; NEW YORK, 10:00 A. M.; BOSTON, 3:40 P. M.

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W. K. MUIR, Gen. Supt. Gt. Western R. W.

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(EXCEPT SUNDAY.)

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4:30 P. M. AFTERNOON EXPRESS.

(EXCEPT SATURDAY)

Arriving at Michigan City 6:30 P. M. (Supper); LaFayette, 11:30 P. M.; Indianapolis, 2:15 A. M.; Louisville, 7:00 A. M.; Nashville, 4:00 P. M.

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SPECIAL NOTICE.—This Train stops at Michigan City for Supper, and waits at that point for Michigan Central Atlantic Express East, leaving Chicago at 4:45 p. m. Passengers going South, and wishing as much time in Chicago as possible, can take the 4:45 p. m. Michigan Central Atlantic Express, and connect without fail at Michigan City, with above Through Louisville Express.

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11:30 A. M. AND 9:00 P. M. Trains from Chicago Connect at Kalamazoo

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